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SUBJECT: Status Report on Experiment Descriptions for the Automated Task Scheduler (ATS) Program - Case 610

DATE: June 30, 1970

FROM: B. H. Crane

ABSTRACT

Preliminary in-flight scheduling requirements for Skylab experiments are being translated into a format suitable for input to the Automated Task Scheduler (ATS). This experiment data base is being constructed to explore the capability of the ATS program to generate prototype crew and equipment timelines for the first Skylab mission.

Tasks included in the data base represent major blocks of crew time for experiments currently assigned to the first Skylab mission, with the exception of the Apollo telescope mount (ATM) experiments, the earth resources experiment package (EREP), and three corollary experiments. Task descriptions for these experiments will be needed to complete the data base. Experiment tasks are scheduled relative to an assumed cycle of sleeping, eating, system housekeeping, and crew personal time.

Types of requirements presently incorporated in the data base include the required number of task repetitions, crew time requirements, constraints stated directly in terms of other tasks in the data base, constraints relative to spacecraft day/night passes, and requirements relative to some of the major systems shared by many experiments. Other requirements that affect scheduling must be added to these task descriptions as they become better defined. Expansion of the ATS input structure would facilitate incorporation of some types of experiment requirements that can only be accounted for indirectly with the present formats.

As the data base develops with use, the task descriptions will be modified to reflect a scheduling strategy that meets all requirements for a maximum number of tasks. Information may also be added to the task descriptions that is useful primarily for subsequent evaluation of the output schedule.

Since scheduling requirements will be different for each Skylab mission, separate data bases will be required for the two fifty-six day Skylab flights.

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MEMORANDUM FOR FILE

1. Introduction

The Automated Task Scheduler (ATS) is a computer
program being written at Bellcomm by A. B. Baker and D. P.
Nash. This program creates a mission timeline from a set
of task descriptions and a predetermined time history of
mission events. Each task description establishes a
priority, a minimum and maximum number of repetitions, if
applicable, constraints on times at which the task may be
scheduled, and resources that must be available.

Tasks are considered for scheduling one-at-a-time
in order of priority. When a task comes up for scheduling,
"windows" of permissible times are found that are consistent
with all specified requirements. If more than one repetition
is to be scheduled, "windows" are defined only when the
minimum number of repetitions can be scheduled acceptably.

After finding at least one "window", a task is
scheduled at the earliest permissible time. Task repetitions
are scheduled relative to the first performance of the task
as specified in the task description. If no "window" exists
for a given task, the scheduler proceeds to the next task in
the priority order. Thus the task descriptions completely
determine the output of the scheduler for a given set of
events and resource limitations.

The discussion of techniques for representing
Skylab experiment requirements in this memorandum is based
exclusively on the task-description formats provided with the
ATS. The objective of this study has been to explore methods
for using the present formats to incorporate as many types of
Skylab experiment requirements as possible in the output
schedules generated by the ATS. ATS task-description formats
are summarized in Appendix A to indicate the current ATS
definition on which this memorandum is based. ATS input
formats will be fully reported by Baker, et al., in their
documentation of the ATS program.

Appendix B presents a detailed illustration of the process of task description for a particular experiment, M092 - In-flight Lower Body Negative Pressure (LBNP). The appendix identifies M092 operational requirements that may affect scheduling and discusses one means of representing these requirements in the task-description formats described in Appendix A.

The preliminary experiment data base contains less detailed task descriptions for a variety of Skylab experiments. An interim version of the data base is presented as Appendix C. A brief description follows of the experiments included in the data base, the types of requirements represented, methods used to incorporate these requirements in the scheduling process, and some of the primary assumptions made in preparing the task descriptions.

2. Preliminary Experiment Data Base

Task descriptions in the preliminary experiment data base assume a twenty-eight day Skylab mission. Time is blocked out at the beginning of the mission for lift-off, ascent, rendezvous, docking, OWS activation, and CM/SM power down. Similarly, time is blocked out at the end of the mission for Skylab deactivation,and CM/SM power-up, separation from the cluster, deorbit, reentry, and landing.

A basic twenty-four hour cycle of sleeping, eating, recreation, and personal hygiene is assumed for the experiment phases of the twenty-eight day Skylab mission. These activities are performed concurrently by the three flight-crew members. Each experiment day begins with a breakfast period that immediately follows sleep. A lunch period is scheduled after completion of the "morning" experiments, and the day ends with a supper, rest, and personal hygiene period that immediately precedes sleep. Two hours of system housekeeping is performed three times during the day, except when interrupted by an EVA.

Experiment tasks presently included in the data base represent major blocks of crew time that must be scheduled for the experiments listed in Table I. As noted in the table, some experiment activities are not included explicitly in the task list because they are scheduled along with operational tasks such as meal periods. SL-1/SL-2 experiments that have not yet been included in the preliminary data base are: Apollo telescope mount (ATM) experiments, earth resources experiments (EREP), M479 - Zero-Gravity Flammability, S063 - UV Airglow Horizon Photography, and T020 - Foot-Controlled Maneuvering Unit.

TABLE I

EXPERIMENTS INCLUDED IN THE PRELIMINARY EXPERIMENT

DATA BASE FOR THE TWENTY-EIGHT DAY SKYLAB MISSION

D008	Radiation in Spacecraft
D021	Expandable Airlock Technology
M092	In-Flight Lower Body Negative Pressure
M093	Vectorcardiogram
M131	Human Vestibular Function
M171	Metabolic Activity
M507	Gravity Substitute Workbench
M508	EVA Hardware Evaluation
M509	Astronaut Maneuvering Equipment
M512	Materials Processing in Space
S009	Nuclear Emulsion
S015	Zero-G Single Human Cells
S019	UV Stellar Astronomy
S020	UV/X-Ray Solar Photography
S073	Gegenschein/Zodiacal Light
S149	Particle Collection
T003	In-Flight Aerosol Analysis
T013	Crew-Vehicle Disturbance
T025	Coronagraph Contamination Measurement
T027	ATM Contamination Measurement

NOTES:

1. Some activities of these experiments are assumed to be a part of operational tasks such as meal periods, EVA, cluster activation, and cluster deactivation.

2. The following experiments are assumed to be incorporated entirely in other tasks for preliminary scheduling.

D024	Thermal Control Coatings	M151	Time and Motion Study
M071	Mineral Balance	M172	Body Mass Measurement
M073	Bioassay of Body Fluids	M402	Orbital Workshop
M074	Speciman Mass Measurement	M487	Habitability/Crew Quarters

3. Tasks for the following experiments have not yet been included in this interim version of the data base: Apollo telescope mount (ATM) experiments, earth resources experiment package (EREP), M479 - Zero-Gravity Flammability, S063 - UV/ Airglow Horizon Photography, and T020 - Foot-Controlled Maneuvering Unit.

        Task descriptions in the preliminary data base
presently include the required number of task repetitions,
where applicable, crew-time requirements, constraints stated
directly in terms of other tasks in the data base, and some
resource requirements. These task descriptions incorporate
many assumptions as to how the experiments should be scheduled
as well as actual constraints. Several examples are discussed
in the following sections.

2.1 Scheduling of Four Medical Experiments

        Task descriptions for the following four medical
experiments reflect considerable planning in the manner in
which they will be scheduled by the ATS, so as to meet the
stated requirements:

        M092 - In-flight LBNP

        M093 - Vectorcardiogram

        M131 - Human Vestibular Function

                Mode A - Semicircular Canal Test
                Mode B - Spatial Localization Test

        M171 - Metabolic Activity

                Mode A - Resting Metabolic Rate and
                         Bicycle Ergometer
                Mode B*- Unsuited Maintenance and
                         Constant Work Tasks
                Mode C*- Suited Maintenance and Constant
                         Work Tasks

Trials of each mode are scheduled as separate tasks that are
repeated several times throughout a mission.

        Test phases of M092, M093, and M171-Mode A must be
preceded by at least three hours of fasting by the subject.
Using the cycle of eating and sleeping described above, trials
of these experiments must occur in either the late "morning,"
three hours after breakfast, or in the late "afternoon," three
hours after lunch.

        An additional requirement of both M092 and M171 is
that all trials of one of these experiments for the same
subject be conducted at approximately the same time of day.
This requirement has been met in the preliminary data base
by selecting, arbitrarily, which trials are to occur in the
late "morning" and which ones in the late "afternoon". All

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        *Subsequent to writing this memorandum, Modes B and C
were deleted by MSC.

modes of M171 for two crewmen are restricted to late
"morning" opportunities with appropriately spaced repe-
titions throughout the mission. Trials of M171 for the
third crewman and all trials of M092 are scheduled in the
late "afternoon," because the "morning" opportunities are
mostly filled by M171 trials for the first two crewmen.

Although M093 trials do not have a requirement
to be performed at approximately the same time of day, they
will also be scheduled in the late "afternoon" opportunities
the way the task descriptions have been written. Care had
to be taken, however, to avoid conflicts among the different
required frequencies for repetitions of M092, M093 and M171
occurring in late "afternoon" opportunities. Repetitions of
M131 do not conflict in the same manner, because these trials
can occur as little as one hour after a meal period.

Experiments M092, M093, M131, and M171 use equipment
that is connected to the experiment support system (ESS).
Although the ESS can only support data collection for one
experiment at a time, opportunities do exist for overlap of
preparation and post-experiment phases that only involve one
crewman. In the preliminary data base it is assumed that
overlap in the preparation and post-test phases of these
experiments is undesirable on a random basis, because of
possible interference among crewmen in the area of the ESS.
If planned overlaps are desired in specific preparation and
post-experiment phases, a new task must be defined to schedule
two or more trials as a unit.

2.2 Experiments Performed in a Scientific Airlock

A different type of scheduling constraint is
illustrated by experiments that must be mounted in the
same scientific airlock. Typically these experiments have
a set-up task, several observation tasks that are scheduled
separately, and a stowage task. It is not currently possible
to have the ATS consider the scientific airlock occupied after
the set-up task is scheduled and keep it occupied up to the
time at which the stowage task is scheduled. Sequencing of
all tasks that use the same scientific airlock is one means
of working around this limitation of the ATS.

As specified in the preliminary experiment data
base, a sequence of experiment tasks that occupy a particular
scientific airlock will be scheduled up to the first task for
which no opportunity exists. Since the program schedules
each task at the earliest permissible time, the output schedule

will contain a maximum number of tasks that can be scheduled without passing over any task in the sequence.* If the overall sequence does not schedule completely, subsequent runs of the scheduler program can be modified by either putting these tasks at higher priorities or by changing their relative position in the sequence.

Additional scheduling problems are presented by Experiment S019, UV Stellar Astronomy, which must be included in the sequence of tasks for the anti-solar scientific airlock. First, this experiment has a requirement that the spectrograph not be mounted in the scientific airlock for more than twelve hours total between exposures. Since more than twelve hours elapse during supper, rest, sleep and breakfast periods of the standard crew day assumed here, setup and stowage tasks must be scheduled on the same day as S019 observations.

Second, the experiment cannot be done during maneuvering by the cluster. The cluster normally maneuvers to a different attitude on each night pass to dump an accumulated momentum bias in the control moment gyros. It is assumed, arbitrarily, that these dump maneuvers cannot be suspended for more than one consecutive night pass to permit scheduling of S019.

To meet these requirements in the preliminary experiment data base, S019 is divided into several sub-sequences that each include a setup task, three or at most four night pass observations, and a stowage task. It would be advantageous for the ATS to schedule each of these sub-sequences as a group in the same manner that repetitions of a single task can now be scheduled as a group. This approach would force the program to look for a day on which an entire S019 sub-sequence could be scheduled before attempting to schedule any part of it. "Windows" would occur for the setup task only when the other tasks in the sub-sequence could be scheduled acceptably.

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*Scheduling of each task in the sequence is enabled by successful scheduling of the previous task in the sequence. Since the first task is not enabled by a previous task, N-1 enable statements are needed to place N tasks in this type of sequence. It is also possible to specify a sequence by inhibiting each task relative to all other prior tasks in the sequence. This approach permits the program to go on scheduling the sequence after some task has failed to schedule, but the number of inhibit statements required is $\sum\limits_{i=2}^{N} (i-1)$.

Since no group capability is presently available
in the ATS input format, the tasks in each S019 sub-sequence
are enabled sequentially in the same manner as other tasks
in the overall sequence. The ATS will schedule the setup
task at the earliest available opportunity, then attempt to
schedule repetitions of the observation task within the same
crew day. The stowage task can be scheduled without completing
all repetitions of the observation task, but only if an
opportunity still exists on the same crew day. Failure to
schedule the stowage task will terminate scheduling of the
remaining tasks in the overall sequence.

2.3 Maneuvering Experiments

Experiment M509, Astronaut Maneuvering Equipment,
uses nitrogen gas as a propellant during free-flight trials.
Dumping of excess nitrogen into the cabin atmosphere, which
raises the total cabin pressure, must be spaced to permit a
sufficient flow of oxygen over time to maintain an acceptable
partial pressure of oxygen. MSC is currently scheduling M509
as six runs on the first Skylab mission. A minimum of two to
five days is required between runs, depending upon the amount
of free flight in each run.

In the preliminary data base, M509 is presented as
six distinct tasks that must be scheduled sequentially, leaving
the required number of days between runs. Trials of T020,
Foot-Controlled Maneuvering Unit, would have been added to the
sequence of M509 runs if T020 had been included in the data
base, since T020 also releases nitrogen in the free-flight
mode. The sequence assumed for M509 spans a minimum of twenty-
one days, so it is unlikely that T020 trials could be completed
for even one subject on the twenty-eight day mission, assuming
that all of M509 is scheduled.

The M509 maneuvering unit releases oxygen into the
cabin atmosphere during tethered flight, as does the pressurized
space suit worn by the subject in one mode of the experiment.
The primary constraint on excess oxygen is avoidance of over-
pressures that may actuate the cabin-pressure relief valve.
It appears that other tasks in the data base that release
oxygen into the cabin atmosphere can be scheduled between runs
of M509 without exceeding these limits, but exact constraints
are still not defined.

Judicious scheduling of other tasks that release
oxygen into the cabin atmosphere may somewhat reduce the required
time delay between free-flight modes of M509. The capability
does not exist to account for this effect directly in the ATS
program, however. One would have to further structure the
sequence of tasks desired via the task descriptions, or find
a combination of priorities and other constraints that produce
an acceptable schedule.

Trials of M509 cannot be run simultaneously with the
OWS phase of Experiment T013, Crew Vehicle Disturbance, which
involves crew members in the same general volume. Since both
experiments require at least two crewmen throughout, no special
provision is needed to meet this requirement.

3. Discussion of the Present Status of Task Descriptions

The task sequences and other techniques described
above take care of many potential conflicts among tasks that
are constrained relative to one another. Requirements such
as electrical power, data recording, attitude stabilization,
and use of operational cameras must still be accounted for in
the individual task descriptions, however, since many different
types of tasks may share these resources. Although representa-
tion of these requirements in the task-description format is
discussed in Appendix B, they have not all been incorporated in
the preliminary data base in Appendix C. Other types of
requirements may also be identified that should be incorporated
in the data base, because they affect scheduling of the tasks
included.

Pointing and attitude-stabilization requirements
cannot be handled directly with the present ATS task-description
formats. For the experiments included in the preliminary data
base, however, only minor deviations from the cluster's normal
solar-inertial attitude hold occur during CMG momentum dump
sequences or a programmed pointing bias for S020 or T025.
Suspension of momentum dumps during S019, UV Stellar Astronomy,
and S073, Gegenschein/Zodiacal Light, is provided for indirectly
by scheduling these experiment trials on non-consecutive night
passes. Perceptible accelerations cannot be tolerated during
some medical experiments, and no provisions have been made to
avoid this problem. Lack of pointing requirements may be a more
serious problem in scheduling the present list of experiments
along with Apollo telescope mount (ATM) experiments and the
earth resources experiment package (EREP).

Crew time and other resources needed to support
photography for Experiment M151, Time and Motion Study, have
also not been incorporated in the preliminary data base.
Although the actual photography does not add any time to the
portions of other experiments to be photographed, additional
preparation and post-operation time are required for each
photographic sequence. The amount of time required to prepare
for any one sequence depends upon whether a camera and portable
flood light are already mounted in the correct location, whether
a usable film magazine and lens are already mounted on the camera,
and whether the camera has been just used for a similar sequence.
One solution to this problem is discussed in Appendix B. A
second potential solution would require updating the M151
preparation times entered in the appropriate task descriptions
after examining a previous output of the scheduler.

In many cases where requirements cannot be considered directly in the scheduling process, it is advantageous to add information in the task descriptions for use in reviewing the output schedule. It would be possible with the present task-description format, for example, to build up a time history of all gas released into the cabin or dumped to space by the tasks being scheduled. This data would provide a partial input to subsequent analysis of the total pressure and component partial pressures of the cabin atmosphere over time.

Other factors that must be reviewed as a separate analysis include the thermal environment in the spacecraft and the allocation of particular station passes to playing back a specific on-board tape recorder. Any conflicts between the output schedule and the requirements in these areas must be corrected by subsequent manipulation of the task-descriptions to achieve a satisfactory schedule.

4. Conclusion
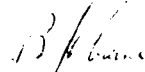
Experiment requirements considered for the preliminary experiment data base can be accounted for in the available ATS task-description format with sufficient structuring of related groups of tasks. Expansion of the input capability would permit a more direct expression of some requirements and additional task groupings that would be useful for scheduling. Flexibility in grouping tasks would permit more direct control over scheduler action and reduce the number of runs required to obtain a full schedule when difficulty is encountered in scheduling some tasks.

Much work remains to be done on the preliminary data base before it can be used to generate a realistic schedule for the twenty-eight day Skylab mission. Steps required in working toward this objective include:

1. Addition of task descriptions for Apollo telescope mount (ATM) experiments, the earth resources experiment package (EREP), and three additional corrolary experiments assigned to this mission.

2. Identification and incorporation of remaining operational and experiment requirements that affect the scheduling of tasks in the timeline.

3. Maintenance of up-to-date requirements in the task descriptions, and

4. Modification of the task descriptions between successive runs of the ATS program to obtain a schedule that meets all requirements for a maximum number of assigned tasks.

Since scheduling requirements will be different for each Skylab mission, separate data bases will be required for the two fifty-six day Skylab flights.

1025-BHC-li   B. H. Crane

Attachments

APPENDIX A

ATS FORMATS FOR TASK DESCRIPTIONS

The ATS task-description formats summarized in this
Appendix were supplied by A. B. Baker as inputs to this study.
They have been updated as the study progressed to reflect the
present status of the program. Only sufficient information is
presented here to clarify subsequent discussion and illustra-
tion of the task description format in Appendix B and Appendix C.

Each task to be scheduled by the ATS is defined by
a name, a set of task-description statements, and a time
variable (internal to the program) to which the task-description
statements are keyed. This time variable is called the "start
time" in the following discussion for descriptive purposes,
since it is often chosen at the beginning of some phase of the
task. Crew-time requirements and other resource requirements
associated with a task can occur in any position relative to
the arbitrary "start time", depending upon the times entered
in the task-description statements.

Task-description formats presently available in the
ATS program are shown in Table II. These formats are punched
onto cards for input to the ATS. Each statement consists of
a set of identifier fields and a set of data fields. The first
identifier field is always the name of the task to which the
statement belongs. Subsequent identifier fields include numerical
values for some requirements and times at which the requirements
apply, where applicable.

The major functions of each type of card are briefly
described in the following paragraphs. More detailed rules
for task description are summarized in Table II.

1. Priority card - Each task description begins with
a priority, which may be entered by means of a priority card.
The priority number assigned to each task determines the
order in which it will be considered for scheduling by the
ATS. Tasks with the lowest priority numbers are scheduled
first when opportunities exist. Tasks with the same priority
number are considered for scheduling in the order in which
they were originally placed in the data bank. A dummy task
may be inserted with a zero priority, and no attempt is made
to schedule it.

2. Objective card - The second type of information
in a task description is always an objective, which may be
entered by means of an objective card. The objective card
must specify both a minimum and a maximum number of task
performances that the program should attempt to schedule.
If the minimum number of repetitions cannot be scheduled,
the program will go on to the next task in the priority
order without scheduling any performances of this one.

Two optional data fields also exist on an objective
card for tasks that are to be repeated. They may be used as
follows:

    a. Two values of time in these data
       fields specify (1) a desired
       frequency for "start times" of
       the repetitions, and (2) a per-
       missible deviation from this
       frequency for each "start time".

    b. A time and the word "MIN" written
       into these data fields specify a
       minimum time between "start times"
       of the repetitions.

When the optional data fields are left blank,
repetitions are scheduled as close together as possible,
consistent with available opportunities. A repetition of
the same task is not permitted to have any of its resource
requirements overlap in time with any resource requirements
of the previous performance, as presently implemented. Many
tasks will have a minimum and maximum objective of one, in
which case entries in the optional data fields are not
allowed. A zero objective is also permissible, having the
same net result as a zero priority; no attempt will be made
to schedule this task.

3. Time card - A time card makes a direct specification
of "start time windows" for the task named in the identifier
field, using the same time scale as the scheduler. This time
scale begins at some basic reference time such as lift-off of
a manned mission. Each pair of times in the data fields of a
time card specify an interval in which the task named in the
identifier field can be scheduled. If an odd number of times
are entered in the data fields, the last interval ends at the
end of the mission.

4. Enable card - The function of an enable card is
very similar to a time card, except that "windows" for the
task named in the first identifier field are defined relative
to the "start time" of a second task identifier, which is of

higher priority. These "windows" exist only if the higher priority task has been previously scheduled. An unsuccessful attempt to schedule that task precludes scheduling of all lower priority tasks enabled by it.

In case more than one repetition of the higher priority task is scheduled, "windows" specified by an enable card for a lower priority task are opened relative to each repetition. The option also exists in the present program to specify that the lower priority task is enabled only by the last repetition of the higher priority task that has been scheduled.

5. Inhibit card - An inhibit card specifies an interval in which it is not permissible to schedule the first task named in the identifier fields. As in an enable card, times entered in the data fields of an inhibit card are measured relative to the "start time" of a second task named in the identifier fields, which must be of higher priority. Only one interval may be specified in the data fields of each inhibit card, however.

The first task in the identifier fields is inhibited relative to all repetitions of the second task, where applicable, without the option of selecting only the last one. An unsuccessful attempt to schedule the higher priority task in this case does not affect scheduling of the lower priority task. The inhibit card simply does not apply.

6. Resource card - A resource card states a requirement that a given resource be available over a specified interval relative to the "start time" of the task named in the identifier field. Different types of resource cards are distinguished by the manner in which the resource name in the identifier fields has been defined to the program in separate input data. Three types of resource are possible in the present program.

The first type may be shared by any number of tasks without conflict. In this case the present program requires that a time history of binary information be read in as input data, such as intervals over which the sun is visible from the spacecraft. Requirements are compared with the input data to determine the individual "start time" windows defined by each requirement. The negative of the resource may also be named on the resource card as a task requirement.

The second type of resource is totally occupied by a task over some interval, so that no other task may occupy it over the same interval. Examples are a crew member or a piece of equipment required to perform a task. A time history of commitments for each of these resources is built up as tasks are scheduled. "Start time windows" created by this type of resource requirement depend upon the order in which the task is scheduled relative to other tasks with similar requirements.

The third type of resource is used at a specified rate over a given interval of time, such as electrical power. Commitments for this type of resource represent the sum of all rates applicable over each interval with distinct requirements. A limit is provided as input data that cannot be exceeded in scheduling tasks. A rate resource may also be used to count the number of items such as a camera or portable light in use at any time relative to the number available for use on each mission.

7. <u>Amount card</u> - An amount card states a requirement that a given quantity of a consumable be available to perform a task. As presently implemented, a total quantity of the consumables is allocated for each mission. This initial quantity is used up as tasks are scheduled by the amount of each task requirement. Scheduling is constrained only by a requirement that would fully deplete the remaining quantity at any point in the scheduling process.

A task description is initially entered into the computer as a set of input cards with distinct identifier fields. These cards may be distributed randomly throughout the input deck, as long as the first information to be read for a new task is a priority and an objective in that order. The computer assembles the information for each task into a linked structure, called a task tree, in the order in which it is encountered in the input deck.

Input cards may modify as well as add to information that has previously been read into a task tree, according to the following rules:

1. A card with an identifier field not previously encountered is added to a task description.

2. A card with a previously established identifier field and new data will simply replace the previous statement.

3. A card with a previously established identifier field and the word "DELETE" in place of data fields will cancel the previous statement.

<u>Equivalence card</u> - An equivalence card provides a means of creating a new task description by reading statements previously submitted under a different task name. When an equivalence card is encountered, the priority and objective that begin the previously entered task description are automatically read first into the new task description, according to the rules. Only the information in the previously-entered task description at the time the equivalence is encountered will be read into the new task description. Either task description may be added to or modified by subsequent cards without affecting the other.

The option exists to read an input deck onto a data bank that is stored by the computer. When a schedule is run, this data bank or a portion of it may be read as the first part of the input data. Data cards submitted with the scheduler run are treated as additions, modifications, or deletions to the data bank, as though they had been supplied at the end of the original deck. The cards submitted with the scheduler run apply only for that run, however. Permanent edits to the data bank are made in a separate run for this purpose.

TABLE II

TASK-DESCRIPTION FORMATS

Card Name	Identifier Fields	Data Fields
Equivalence card:	Task i/EQUIV,	Task j
Priority card:	Task i/PRI,	K
Objective card:	Task i/OBJEC,	$M,N, \begin{array}{c} t_m, \text{ MIN} \\ \text{or} \\ t_f, t_\delta \end{array}$
Time card:	Task i/TIME,	$t_1, t_2, t_3, t_4 \ldots$
Enable card:	Task i/ENABLE, Task j,	$t_1, t_2, t_3, t_4 \ldots$
Inhibit card:	Task i/INHIB, Task j,	$t_1, t_2,$
Resource card:	Task i/RES, Resource name,	t_1, t_2, R
Amount card:	Task i/AMOUNT, Resource name,	Q

Definition of Symbols:

Task i, Task j -- Task names made up of any combination of six letters or numbers.

Resource name -- Resource names made up of any combination of six letters.*

K, M, N -- Non-negative integers:

> K - An assigned value of priority
>
> M - The minimum number of repetitions desired
>
> N - The maximum number of repetitions desired

R -- A rate at which the resource is used by Task i

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*More than one card may be needed for the same resource in some cases, but multiple cards for the same resource name have the same identifier fields. To get around this problem, integers 1, 2, 3, . . ., 9 may be added to resource names of five letters or less (i.e., AMPWR1, AMPWR2). The program interprets such cards as having distinct identifier fields, but the resource names are interpreted as the same resource. Alternatives to this procedure are under consideration.

Q   -- An amount of the resource used by Task i

t   -- Time in days, hours, and minutes expressed
                              in the general format: xx:xx:xx

      t_m - A minimum time between "start times"
        for repetitions of Task i

      t_f - A desired interval between "start times"
        for repetitions of Task i

      t_δ - An allowable deviation (+ or -) from
        the t_f centers for repetitions of Task i

$t_1, t_2,$ -- Lower and upper bounds on intervals of time,
t_3, t_4 which are interpreted as follows for each
        card:

  (1) <u>Time</u> <u>card</u>: A "window" of permissible
    "start times" for Task i - times are
    measured from some basic reference time
    such as lift-off of a manned mission.

  (2) <u>Enable</u> <u>card</u>: A "window" of permissible
    "start times" for Task i - times are
    measured from the "start time" of Task j.

  (3) <u>Inhibit</u> <u>card</u>: An interval in which the
    "start time" of Task i is not permitted to
    be scheduled - times are measured from the
    "start time" of Task j.

  (4) <u>Resource</u> <u>card</u>: An interval over which the
    stated resource is required - times are
    measured from the "start time" of Task i.

<u>Rules for Task Description</u>

  1. Only one card with the same identifier field applies.
A second card with the same identifier field is interpreted as
a replacement, unless it is a delete card.

  2. A specific task name must be used first in the
identifier field of either an equivalence card or a priority
card.

  3. If a task name is introduced by an equivalence card,
the task named in the data field must already be in the data
bank. Cards previously entered for that task are automatically
read with the new task name. Other cards for either task may
follow, however, in any desired order.

4.   If a task name is introduced by a priority card, the next card that begins with this task name must be an objective card.   Five options are currently available for a task objective:

   a.   No trials are to be scheduled (the first two data
        fields contain a zero).

   b.   One trial is to be scheduled (the first two data
        fields contain a one).

   c.   Two or more trials are to be scheduled in the nearest
        available opportunities without overlapping any of
        the resource requirements listed under this task (the
        first two data fields specify the minimum and maximum
        number of trials desired.

   d.   Two or more trials are to be scheduled at a minimum
        specified interval between "start times" but not
        closer than they would be under (c) above (the first
        two data fields specify the minimum and maximum
        number of trials desired, the third data field
        contains the minimum time between "start times," and
        the fourth data field contains the word "MIN").

   e.   Two or more trials are to be scheduled at a designated
        frequency plus or minus a given tolerance on each
        "start time" (the first two data fields specify the
        minimum and maximum number of trials desired, the
        third data field contains the frequency, and the
        fourth data field contains the tolerance).

5.   Any number of task-description cards may follow an objective card for the same task in any desired order, except an equivalence card.

6.   The data field of a time card or an enable card may specify multiple "windows" for the "start time" of the task named in the identifier field.   If an odd number of times are specified, the end of the last "window" is put at the end of the mission.

7.   The second task in the identifier fields of an enable card or an inhibit card should be of higher priority than the first task identifier.   For an enable card only, this task name may be preceded by "(LAST)", restricting the applicability of the enable card to the last repetition of the higher priority task that has previously been scheduled.

8.   The resource named on a resource card may be one of three types:

   a.   Binary, ephemeris-related resources (input data)

   b.   Binary commitment resources (scheduled)

   c.   Numeric, rate-type resources (scheduled).

A rate specification must appear as the last field of the resource card for a rate-type resource; otherwise, this field must be blank.

9.   The name of a binary resource from an ephemeris tape may be preceded by "(NOT)" on a resource card, indicating the negative of this resource (e.g., "(NOT) DAY").

10.   The designation "ANY" can be substituted for the name of a specific crewman in writing crew-time requirements in order to select any available crewman to perform a task. If specific crewmen are also named in the same task description, however, the specific crew requirement should come first.

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APPENDIX B

ILLUSTRATION OF THE TASK DESCRIPTION

FORMAT FOR EXPERIMENT M092 - IN-FLIGHT

LOWER BODY NEGATIVE PRESSURE (LBNP)

Experiment M092 requires that a set of lower body negative pressure (LBNP) tests be carried out on each of the three crewmen periodically throughout the mission. Each test may be scheduled as a single task that includes preparation, test phases, and a post-test phase. These tasks are identical, except that different crew members serve as subject and observer.

Requirements of an M092 trial that may be of interest in scheduling are summarized under the following ten categories in this discussion:

1. Crew activities

2. Relationship to other tasks

3. Mission events

4. Pointing and attitude control

5. Equipment

6. Data

7. Electrical power

8. Lighting

9. Thermal

10. Gas and fluid.

Each section contains a brief statement of requirements in that category followed by an explanation of how these requirements can be represented in the ATS input format described in Appendix A.

Table III shows a sample task description for an M092 trial. Each statement is cross-referenced to one or more of the ten sections that explains the requirements and any special assumptions used in representing them. Although some scheduling

decisions are implicit in this task description, they are introduced only as one means of accounting for the stated requirements.

Appendix C presents a somewhat different task description for M092 that is tailored to the particular scheduling assumptions and level of detail incorporated in the preliminary data base.

1. Crew Activities

1.1 Requirements

Each trial of M092 requires that one crewman serve as subject and a second crewman serve as observer during the following activities:

25 minutes of preparation,

8 minutes of calibration and checkout,

15 minutes of data collection at negative pressure,

5 minutes of recovery from the reduced-pressure phase, and

15 minutes of deinstrumentation of the subject.

An additional 8 minutes of cleanup and stowage requires only one crewman. The 28 minutes of calibration, checkout, negative pressure, and recovery are referred to as "test phases" in the following discussion.

Each crewman must serve as subject in a minimum of five M092 trials during a Skylab mission. Presumably the five trials for each man are to be spaced fairly evenly throughout the mission. An additional requirement is that different trials for the same subject are to be scheduled as nearly as possible at the same time of day.

An astronaut physician was presumed to be required as the observer unless he is serving as subject.* A second crewman is trained to be an observer when the astronaut physician is serving as subject.

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*This requirement has recently been deleted by MSC.

Photography of some portions of M092 is required by Experiment M151, Time and Motion Study.* It is anticipated that the M092 activities of interest to M151 occur during preparation and deinstrumentation phases of M092, although specific requirements are not yet available. One crewman is required to mount the 16mm data acquisition camera (DAC) and portable flood light before the M092 trial begins, if necessary, and prepare for photography. It is assumed that the light is turned on at the beginning of the M092 trial and turned off at the end. Post-trial activities include securing camera control and power cables and making appropriate entries in the experiment log. No additional time is needed during the M092 trial to support M151.

1.2   Representation of these Requirements

In the sample task description in Table III, requirements that are common to all trials of M092 are incorporated in a dummy task named M092T0. The zero priority associated with M092T0 assures that it will never be scheduled. Its requirements are automatically reproduced under each of the following M092 tasks by equivalence statements.

M092T1 - M092 trials for the first crewman,

M092T2 - M092 trials for the second crewman, and

M092T3 - M092 trials for the third crewman.

A new priority card is inserted for each of these tasks to replace the zero priority of M092T0.

Since the required number of repetitions is the same for each crewman, one objective card can be written under M092T0 for each of the three tasks. A minimum time of five days between "start times" on the objective card assures that each subject will be tested over a duration of at least 21 days. A twenty-eight day Skylab mission was assumed in this example. The five-day minimum is completely arbitrary, chosen as a reasonable way to schedule this experiment. The first trials of M092T1, M092T2, and M092T3 could start on different days, even though the objective is the same for each of these three tasks.

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*Available requirements are obtained from a preliminary version of the M151 Experiment Requirements Document (ERD) dated December 1969.

Crew requirements must be included under the individual task descriptions for M092T1, M092T2, and M092T3. The "start time" for all of these tasks is chosen at initiation of the test phases (8 minutes of calibration, 15 minutes of negative pressure, and 5 minutes of recovery). The subject is required 25 minutes before this "start time" for the preparation phase. He is then required for 51 minutes after this "start time" to include the 28 minutes of test phases, 15 minutes of deinstrumentation, and 8 minutes of one-man stowage tasks, which have been arbitrarily assigned to him.

The observer has been assigned to perform all tasks associated with M151 photography in the same task description. Eight minutes are allowed, arbitrarily, to point the camera, load film, change the lens, check the power connection, deploy the remote-control cable, make appropriate camera settings, and turn on the photo light. Four minutes of observer time at the end of the deinstrumentation phase cover all post-trial activities.* Not all of this time is needed every time M151 photography is done for M092, but the scheduler does not have the capability to adjust the time required according to how other tasks are scheduled.

It is assumed here that the camera and portable light are normally mounted in the correct location for photographing M092 activities. The same camera and light locations are also used for M151 photography of Experiment M093 – Vectorcardiogram, and the ergometer portion of M171 – Metabolic Activity. Time to move the camera and light would be charged to any experiment trial that required this specific camera and light in a different location for photography.

If it should turn out to be desirable to schedule two trials of M092 together for different subjects, a new task can be defined covering the combined operation. It is anticipated that some time could be saved by this approach, particularly in the area of M092 stowage and M151 support. The adjustment would be presented to the scheduler, however, as a different set of crew-time requirements for the combined procedure.

Repetitions of M092 trials for the same subject can be scheduled as nearly as possible at the same time each day by selecting a specific time in the daily cycle of eating and sleeping. It is assumed that all crewmen sleep and eat simultaneously. Breakfast is scheduled immediately following sleep

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*The preliminary M151 Experiment Requirements Document of December 1969 shows 3.5 minutes required for activities following photography.

before any attempt is made to schedule trials of M092. An
interval beginning three hours after breakfast was selected
in this example as the time of day for scheduling M092 trials
for all subjects.

"Start times" for M092 trials are enabled between
four and one-half and six hours after the "start time" of the
breakfast period by the enable card included under M092TO in
Table III. The duration of this "window" is completely arbi-
trary. The hour and one-half selected would permit two trials
of M092 to be scheduled on the same day for different subjects
without allowing too much deviation in the "start times" of
trials for any one subject. After considering the requirements
for other medical experiments in Appendix C, however, three
trials of M092 were scheduled on the same day, beginning three
hours after the second eat period.

2.   Relationship to Other Tasks

2.1 Requirements

Requirements included in this category specify
directly the manner in which trials of M092 must be scheduled
relative to other tasks. Resource requirements that are
covered in later sections can also restrict the scheduling of
other tasks relative to M092. Relationships between tasks
that are covered by resource requirements do not have to be
stated here and vice versa.

Operation of M092 presumes that workshop activation
has been completed at the beginning of the mission and workshop
deactivation has not yet begun at the end of the mission. In
addition, each M092 test must be preceded by at least three
hours of fasting by the subject and at least two hours without
vigorous exercise or other stress. Requirements of other medical
experiments that relate to trials of M092 may be summarized
by the general statement that all trials of M092 - In-Flight
LBNP, M093 - Vectorcardiogram, M131 - Human Vestibular Function,
and M171 - Metabolic Activity,should be scheduled so as to
avoid carry-over effects.

2.2 Representation of these Requirements

The time card for M092TO in Table III blocks off
time at the beginning of the mission and at the end of the
mission for workshop activation and deactivation, respectively.
The values of time shown are arbitrary estimates of the time
actually required.

Other requirements in this category are represented
in Table III by enable and inhibit cards, which depend upon

the order in which the other tasks are to be scheduled relative to M092. In this example, sleep, breakfast, and EVA are assumed to be of higher priority than any trials of M092. Tasks assumed to be of lower priority include lunch, tasks not mentioned above that involve stress or vigorous exercise, and all trials of Experiments M093 - Vectorcardiogram, M131 - Human Vestibular Function, and M171 - Metabolic Activity.

The statement enabling M092 trials relative to breakfast partially satisfies the requirement that the subject has fasted for at least three hours prior to the tests. An hour and a half is allotted to the first eat period to accommodate requirements of M071, M073, M074, M172 and T003, as well as the normal time for eating and personal activities. Thus the "start time" of an M092 trial, which was chosen at the beginning of the test phases, occurs a minimum of four and one-half hours after the "start time" of breakfast.

The task description for lunch, which is of lower priority, would have to contain an inhibit card assuring that it does not precede a trial of M092. A similar inhibit is not required for supper, however, because M092 has already been restricted to late "morning" of the crew day.

Two EVA's are planned for the twenty-eight day mission. It is assumed that a trial of M092 for any subject must not occur within two hours of post-EVA operations. No M092 task description cards are needed to cover one of the two EVA's, however, because it is to be scheduled on the twenty-sixth day of the twenty-eight day mission. M092 has already been excluded from day twenty-six by the time card.

The first EVA of the twenty-eight day mission may be scheduled as a single task, EVA1. Assuming the "start time" for this task occurs at hatch opening, post-EVA activities should be completed within three hours and forty-five minutes. An additional two hours before beginning an M092 test brings the required interval between "start times" to the five hours and forty-five minutes shown on the inhibit card under M092T0.

Inhibit cards needed to cover carry-over effects between medical experiments would be included under trials of M093, M131, and M171, since they are assumed to be of lower priority. Unlike the examples so far, separate inhibits must be written between tasks involving the same subject. Other inhibit cards with M092 as the second task must be included for all tasks involving severe exercise or stress that are of lower priority. Taking into account similar requirements of other medical experiments, a considerable number of inhibit cards is needed to cover these requirements. The pre-planned scheduling of the medical experiments used to develop Appendix C precludes the need for some of these inhibits there.

3. Mission Events

　　　　No trajectory-related events have been identified
that directly affect the scheduling of M092.

4. Pointing and Attitude Control

4.1 Requirements

　　　　M092 is unaffected by spacecraft attitude, but linear
or rotational accelerations that would degrade measurements
during the test phases are not permitted. It is anticipated
that a solar-inertial attitude hold with CMG control will be
acceptable, but exact requirements are not available.

　　　　The cluster is normally in a solar-inertial attitude
mode during the sunlit part of the orbit and in a momentum-dump
attitude during a portion of each dark-side pass.

4.2 Representation of these Requirements

　　　　Experiment pointing and attitude control requirements
cannot be stated directly in the task-description format
described in Appendix A. Since very few experiments have
attitude requirements for other than a solar-inertial attitude
hold, it may be possible to cover pointing requirements by a
judicious use of inhibit and event requirements. Otherwise,
attitude scheduling might be done ahead of each run and provided
as input data, as is done for trajectory-related events. This
problem is presently unresolved.

5. Equipment

5.1 Requirements

　　　　Each trial of M092 requires the use of:

　　a. The M092 LBNP device,

　　b. The two M092 leg volume plethysmographs,

　　c. The M092 biomedical cable,

　　d. The M092 blood-pressure cuff,

　　e. An M093 VCG vest, electrodes, and electrode
　　　　checkout device,

　　f. An M171 body temperature sensor,

　　g. The experiment support system (ESS), including
　　　　blood pressure and VCG electronics package, and

　　h. The experiment log book.

Equipment required for M151 photographic support includes:

    a. A Data Acquisition Camera (DAC), mount, OWS
        power cable, remote control camera cable, film
        magazine and appropriate lens, and

    b. A portable photo light.

The experiment support system (ESS) can support only one test phase at a time for one of the four experiments: M092 - In-Flight LBNP; M093 - Vectorcardiogram; M131 - Human Vestibular Function; and, M171 - Metabolic Activity. The ESS is idle, however, during much of the preparation and deinstrumentation phases of these experiments.

The lower body negative pressure device is mounted near the ESS on the floor of the crew quarters experiment area in the OWS. The other medical instrumentation mentioned above is stowed in the ESS when not in use. It is worn by the subject during the trial and connected to the ESS. The camera and photo light are normally mounted in the correct location for this experiment by assumption. Film is stowed in a film vault in the crew quarters experiment area when not in use. The film vault is presently located near the ESS.

5.2   Representation of these Requirements

The sample task description in Table III shows that the ESS is occupied for the complete duration of each trial, excluding the short pre-trial preparation for M151 photography. It is assumed that the other experiments requiring the ESS will state this requirement in a similar manner. This approach reflects a judgment that two crewmen working in the area of the ESS is enough, unless an overlap in preparation and deinstrumentation phases of two trials is specifically planned by combining them into a single task. Having occupied the ESS in this manner, other resource cards would be redundant that named any of the medical instrumentation.

Resource cards are included for the data acquisition camera and photo light, since it is possible for tasks other than Experiments M092, M093, M131, and M171 to use them. Other cameras and lights are also available for use by other experiments, however. Naming a specific camera and light in the requirements facilitates accounting for the time required to move the camera, as discussed in the first section, "Crew Activities". An alternative is to simply keep track of specific cameras and time for moving them for subsequent analysis of the output schedule.

6. Data

6.1 Requirements

        Telemetry data from the experiment support system
must be recorded continuously throughout the test phases of
M092. Two channels are available in the Airlock Module
instrumentation system for recording experiment data. During
M092, the first of these channels, called "EXP 1", receives
a number of analog parameters at 1.25 samples per second (sps),
one at 40 sps, and one component of the vectorcardiogram at
320 sps. The other two components of the vectorcardiogram
are placed on a separate recorder through the second channel,
"EXP 2", at 320 sps each. 640 sps completely utilizes the
5.12 kilobit-per-second telemetry capacity of this channel.
The data for each trial must be recorded without interruption
and played back at a later time over a ground station. (A
playback speed of 22:1 considerably reduces the time required
for playback.)

        The observer is required to voice record his own
comments and those of the subject during test phases of M092.
Voice and telemetry data may be recorded simultaneously over
the "EXP 1" channel. Since all voice data automatically
appears on this recorder when it is running, the only additional
requirement for M092 is that the observer be wearing a headset
that is connected to the intercom system.

6.2 Representation of these Requirements

        The M092 data requirements in Table III show both
"EXPONE" and "EXPTWO" to be fully occupied during data collec-
tion. This representation overstates the actual requirement,
since the full 5.12 kbps has not been used up for "EXPONE".
The remaining capacity could, in principle, be used by another
experiment if the parameters of interest were physically
routed through the same multiplexer as the low-rate data from
M092. A need has not been identified for this type of sharing,
however, during simultaneous performances of experiments that
record data through the Airlock Module instrumentation system.

7. Electrical Power

7.1 Requirements

        Power for all of the medical instrumentation used
with M092 is supplied through the ESS. ESS power is required
throughout the test phases of the experiment.*

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        *Specific values are not as yet available.

Power for the data acquisition camera and photo light are supplied separately through connections near the mounting location. The photo lamp requires 150 watts throughout all phases of an M092 trial, since it was assumed that the lamp would not be cycled on and off during this time. The data acquisition camera requires 16.1 watts only during the sequences to be photographed. A peak of 22.5 watts occurs each time the camera is turned on.

7.2 Representation of these Requirements

Power requirements in the sample task description cover both average power (AMPWR) and peak power (AMPPK) used during various phases of an M092 trial. The numbers following these resource names (e.g., AMPWR1, AMPWR2) are necessary in the current program to make the identifier fields distinct for the multiple statements involving the same resource. The decision to treat preparation, data collection, and post-test phases separately is based on the fact that the ESS will be on during data collection. If it is turned on earlier in the actual procedure, times and power requirements would be altered accordingly.

An alternative representation of these power requirements would be to put in a detailed power profile for the experiment, using a separate card for each increment that occurs over a different interval of time. Each time a camera is turn on, for example, two separate cards would show the initial peak and the camera-drive power during photography. Considerable flexibility exists in the specific representation used for any one experiment. The important thing is to be consistent among all tasks in a data bank.

8. Lighting

The lighting requirement for the test phases of M092 is 100 foot-candles of white light at the subject for the purpose of observing his physiological response to the negative pressure. The special lighting requirements for M151 photography have already been covered under the first category, "Crew Activities", and the fifth section, "Equipment". It is not known whether any additional lighting is needed to meet the M092 lighting requirement.

9. Thermal

9.1 Requirements

Trials of M092 must not be performed when the ambient temperature in the workshop is greater than 78°. A temperature range of 72°±3° is desired.

9.2   Representation of these Requirements

        In practice the effect of thermal requirements on
scheduling of M092 will be evaluated in real time. The ATS
program does not schedule on the basis of cabin temperature
as a function of time. After a schedule has been obtained,
thermal considerations may be reviewed as a separate analysis.

10.   Gas and Fluid

10.1   Requirements

        The LBNP device dumps relatively small quantities
of cabin atmosphere to space for each negative pressure phase.
The blood pressure cuff is pressurized with oxygen periodically
and bleeds this oxygen into the cabin at a constant rate.

10.2   Representation of these Requirements

        No amount cards are included in the sample task
description in Table III to cover these requirements, since
they will not directly affect the times at which the M092
trials are scheduled by the ATS. Amount cards might be
included, however, for information to be used in subsequent
analysis. The current program would use this data simply
to generate separate time histories of gas dumped overboard
to space and gas vented into the spacecraft cabin by all
tasks scheduled from the data bank.

TABLE III

A SAMPLE TASK DESCRIPTION FOR M092 – IN-FLIGHT LBNP

Requirements Common to All Trials of M092:*		Reference**
M092TO/PRI	0	1
M092TO/OBJEC,	5, 5, 05:00:00, MIN	1
M092TO/TIME,	01:18:00, 26:00:00	2
M092TO/ENABLE, BREAK	00:04:30, 00:06:00	1, 2
M092TO/INHIBIT, EVA1	00:00:00, 00:05:45	2
M092TO/RES, ESS	-00:00:25, 00:00:51	5
M092TO/RES, WSDACA	-00:00:33, 00:00:47	5
M092TO/RES, LIGHTA,	-00:00:33, 00:00:43	5
M092TO/RES, EXPONE,	00:00:00, 00:00:28	6
M092TO/RES, EXPTWO,	00:00:00, 00:00:28	6
M092TO/RES, AMPWR1,	-00:00:25, 00:00:00, TBD	7
M092TO/RES, AMPPK1,	-00:00:25, 00:00:00, TBD	7
M092TO/RES, AMPWR2,	00:00:00, 00:00:28, TBD	
M092TO/RES, AMPPK2,	00:00:00, 00:00:28, TBD	
M092TO/RES, AMPWR3,	00:00:28, 00:00:43, TBD	
M092TO/RES, AMPPK3,	00:00:28, 00:00:43, TBD	

M092 Trials for the First Crewman:

M092T1/EQUIV,	M092TO	1
M092T1/PRI,	TBD†	1
M092T1/RES, CREWA,	-00:00:25, 00:00:51	1
M092T1/RES, CREWC,	-00:00:33, 00:00:47	1

---

*Task names and resource names appearing in these requirements are defined on the next page of the table.

**An explanation of each statement and the major assumptions and choices pertinent to it are contained in the referenced section of Appendix B.

†TBD = To be determined.

TABLE III (Cont'd)

M092 Trials for the Second Crewman:

M092T2/EQUIV,	M092TO	1
M092T2/PRI,	TBD	1
M092T2/RES, CREWB,	-00:00:25, 00:00:51	1
M092T2/RES, CREWC,	-00:00:33, 00:00:47	1

M092 Trials for the Third Crewman:

M092T3/EQUIV,	M092TO	1
M092T3/PRI,	TBD	1
M092T3/RES, CREWC,	-00:00:25, 00:00:51	1
M092T3/RES, CREWB,	-00:00:33, 00:00:47	1

Symbols:

BREAK	The first meal period of the day
EVA1	The first EVA of the twenty-eight day mission
ESS	Experiment Support System
EXPONE, EXPTWO	Data channels for on-board recording of experiment data
AMPWR	Average power consumption from the Airlock Module power system over the designated interval
AMPPK	Peak power consumption from the Airlock Module power system over the designated interval
WSDACA	One of the two data acquisition cameras launched in the Workshop
LIGHTA	One of the two portable photo lights launched in the Workshop
CREWA	The first crewman, presumably the mission commander
CREWB	The second crewman, trained to serve as M092 observer when CREWC is a subject.
CREWC	The third crewman, presumably an astronaut physician.

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APPENDIX C

PRELIMINARY EXPERIMENT DATA BASE

The preliminary experiment data base presented in this appendix illustrates ATS task descriptions for a variety of experiments. As discussed in the memorandum, these task descriptions provide only a starting point for exploring the process of scheduling experiments with the ATS program.

A standard notation has been adopted for naming experiment tasks in the data base. This notation may be illustrated by the task name M131A1. The first four characters are the number of the experiment, M131 - Human Vestibular Function. The fifth character designates a specific type of experiment task, Mode A - Semicircular Canal Test. The sixth character distinguishes separate tasks presented to the ATS to schedule all repetitions of M131A. In this case, M131A1 is a group of three trials to be scheduled early in the mission using the first crewman as a subject. M131A2 and M131A3 are similar groups of trials for the second and third crewmen, respectively.

Required repetitions of a task can be specified in the ATS task-description format as either a multiple objective for a single task or as a set of distinct tasks with similar requirements. Distinct tasks are always needed to specify repetitions when any requirement of one is different from the corresponding requirement for another, as in the case of different crewmen required to serve as subject. A second example would be different time requirements for the fix cycles of S015 - Zero-G Single Human Cells, which are to be performed on the fourth mission day and the tenth mission day.

Title and comment cards are included in the preliminary experiment data base to identify each task and to indicate some of the major assumptions used in writing the present task descriptions. The capability to include these cards in the ATS input deck is being implemented. The only change in the rules given in Appendix A is that the title card must now precede all other cards for a given task in the deck.

Types of requirements that are presently incorporated in the task descriptions include task repetitions, crew time, constraints stated directly in terms of other tasks in the data

base, and some resource requirements. Requirements that are only incorporated implicitly are noted in the comment cards. Types of requirements that must still be accounted for to obtain a valid schedule include pointing and attitude control, crew time required before and after photographic sequences for experiment M151 - Time and Motion Study, use of operational equipment such as cameras and auxiliary photo lights, and electrical power profiles. Other factors that may affect scheduling must also be identified and incorporated in the task descriptions, if possible.

As the data base develops, two types of information will be needed in the task descriptions in addition to requirements. First, arbitrary time constraints and task relationships will be needed to reflect scheduling decisions by the user. Second, additional information will be needed to evaluate ATS output schedules that may not directly affect the placement of tasks by the ATS. Examples that have been discussed previously include keeping track of all requirements to have data recorded during the mission for subsequent review of opportunities for tape dumps over ground stations, keeping track of oxygen and nitrogen usage profiles for later assessment of cabin-atmosphere parameters, and keeping track of any factors that affect the thermal environment of the spacecraft for use in separate thermal simulations.

PRELIMINARY EXPERIMENT DATA BASE

```
SLEEP /TITLE,     EIGHT HOUR SLEEP PERIOD FOR ALL THREE CREWMEN

SLEEP /PRI,     1

SLEEP /COMMNT,    SLEEP OCCURS EVERY TWENTY-FOUR HOURS.  THE TOLERANCE
SLEEP /COMMNT,        OF PLUS OR MINUS ONE HOUR ON THE START TIME IS
SLEEP /COMMNT,        ARBITRARY.

SLEEP /OBJEC,  1,60,          01:00:00, 00:01:00

SLEEP /COMMNT,    THE FIRST SLEEP PERIOD IS SCHEDULED TEN HOURS AND
SLEEP /COMMNT,        TWENTY-FIVE MINUTES AFTER LIFT-OFF OF SL-2.
SLEEP /COMMNT,        SL-2 LIFT-OFF IS ASSUMED TO OCCUR AT 2:35 P.M.
SLEEP /COMMNT,        ON JULY 16, 1972.

SLEEP /TIME,                  00:10:25

SLEEP /COMMNT,    A FINAL TIME OF 28:00:00 WILL BE SUPPLIED FOR ALL
SLEEP /COMMNT,        TIME OR ENABLE CARDS OF THIS FORM.  NO ATTEMPT
SLEEP /COMMNT,        IS MADE HERE TO SCHEDULE TIME DURING THE TWENTY-
SLEEP /COMMNT,        EIGHTH MISSION DAY.

SLEEP /RES,    CREW A,        00:00:00, 00:08:00
SLEEP /RES,    CREW B,        00:00:00, 00:08:00
SLEEP /RES,    CREW C,        00:00:00, 00:08:00


BREAK /TITLE,     FIRST MEAL PERIOD OF THE DAY FOR ALL THREE CREWMEN

BREAK /PRI,     2

BREAK /COMMNT,    THE BREAKFAST PERIOD IMMEDIATELY FOLLOWS SLEEP.

BREAK /OBJEC,  1,60
BREAK /ENABLE, SLEEP,         00:08:00, 00:08:00

BREAK /COMMNT,    ASSUMPTION: THE BREAKFAST PERIOD ALLOWS SUFFICIENT
BREAK /COMMNT,        TIME TO PERFORM ACTIVITIES ASSOCIATED WITH M071,
BREAK /COMMNT,        M073, M074, M172, AND T003 AS WELL AS EATING AND
BREAK /COMMNT,        PERSONAL ACTIVITIES.

BREAK /RES,    CREW A,        00:00:00, 00:01:30
BREAK /RES,    CREW B,        00:00:00, 00:01:30
BREAK /RES,    CREW C,        00:00:00, 00:01:30

BREAK /COMMNT,    ASSUMPTION: A T003 MEASUREMENT IS TAKEN AT THE END OF
BREAK /COMMNT,        EACH MEAL PERIOD.  THE REQUIRED FREQUENCY OF
BREAK /COMMNT,        THIS STANDARD MEASUREMENT IS 8 HOURS PLUS OR
BREAK /COMMNT,        MINUS TWO HOURS.

BREAK /COMMNT,    THREE CALIBRATIONS PER MISSION FOR EACH M074 SMMD AND
BREAK /COMMNT,        THE M172 BMMD ARE NOT YET ACCOUNTED FOR.


LUNCH /TITLE,     SECOND MEAL PERIOD OF THE DAY FOR ALL THREE CREWMEN
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PRELIMINARY EXPERIMENT DATA BASE

```
LUNCH /PRI,      18

LUNCH /COMMNT,      LUNCH IS NORMALLY SCHEDULED FOUR AND ONE HALF HOURS
LUNCH /COMMNT,           AFTER THE END OF THE BREAKFAST PERIOD. THE
LUNCH /COMMNT,           TOLERANCE OF PLUS OR MINUS ONE HOUR ON THE START
LUNCH /COMMNT,           TIME IS ARBITRARY.

LUNCH /OBJEC,   1,60,          01:00:00, 00:01:00
LUNCH /TIME,                   00:23:55

LUNCH /COMMNT,      THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

LUNCH /INHIB,   M171A1,        -00:04:15, 00:00:00
LUNCH /INHIB,   M171A2,        -00:04:15, 00:00:00

LUNCH /COMMNT,      ASSUMPTION: THE LUNCH PERIOD ALLOWS SUFFICIENT TIME
LUNCH /COMMNT,           TO PERFORM ACTIVITIES ASSOCIATED WITH M071,
LUNCH /COMMNT,           M073, M074, AND T003 AS WELL AS EATING AND
LUNCH /COMMNT,           PERSONAL ACTIVITIES.

LUNCH /RES,     CREW A,        00:00:00, 00:01:15
LUNCH /RES,     CREW B,        00:00:00, 00:01:15
LUNCH /RES,     CREW C,        00:00:00, 00:01:15

LUNCH /COMMNT,      ASSUMPTION: A T003 MEASUREMENT IS TAKEN AT THE END OF
LUNCH /COMMNT,           EACH MEAL PERIOD.  THE REQUIRED FREQUENCY OF
LUNCH /COMMNT,           THIS STANDARD MEASUREMENT IS 8 HOURS PLUS OR
LUNCH /COMMNT,           MINUS TWO HOURS.


SUPPER/TITLE,      THIRD MEAL PERIOD OF THE DAY FOR ALL THREE CREWMEN

SUPPER/PRI,     3

SUPPER/COMMNT,     SUPPER STARTS TWO HOURS AND FORTY-FIVE MINUTES BEFORE
SUPPER/COMMNT,          SLEEP BEGINS.

SUPPER/OBJEC,   1,60
SUPPER/ENABLE, SLEEP,          -00:02:45,-00:02:45

SUPPER/COMMNT,     ASSUMPTION: THE SUPPER PERIOD ALLOWS SUFFICIENT TIME
SUPPER/COMMNT,          TO PERFORM ACTIVITIES ASSOCIATED WITH M071,
SUPPER/COMMNT,          M073, M074, AND T003 AS WELL AS EATING AND
SUPPER/COMMNT,          PERSONAL ACTIVITIES.

SUPPER/RES,     CREW A,        00:00:00, 00:01:15
SUPPER/RES,     CREW B,        00:00:00, 00:01:15
SUPPER/RES,     CREW C,        00:00:00, 00:01:15

SUPPER/COMMNT,     ASSUMPTION: A T003 MEASUREMENT IS TAKEN AT THE END OF
SUPPER/COMMNT,          EACH MEAL PERIOD.  THE REQUIRED FREQUENCY OF
SUPPER/COMMNT,          THIS STANDARD MEASUREMENT IS 8 HOURS PLUS OR
SUPPER/COMMNT,          MINUS TWO HOURS.


REST   /TITLE,      RECREATION AND PERSONAL HYGEINE FOR ALL THREE CREWMEN
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PRELIMINARY EXPERIMENT DATA BASE

```
REST    /PRI,      4

REST    /COMMNT,      REST FILLS THE TIME BETWEEN SUPPER AND SLEEP.

REST    /OBJEC,    1,60
REST    /ENABLE,  SLEEP,       -00:01:30,-00:01:30
REST    /RES,     CREW A,       00:00:00, 00:01:30
REST    /RES,     CREW B,       00:00:00, 00:01:30
REST    /RES,     CREW C,       00:00:00, 00:01:30


SYSHK1/TITLE,      SYSTEMS HOUSEKEEPING

SYSHK1/PRI,     10
SYSHK1/OBJEC,   1,60

SYSHK1/COMMNT,      ASSUMPTION: THE STANDARD CYCLE OF SYSTEMS HOUSEKEEPING
SYSHK1/COMMNT,          TASKS DOES NOT BEGIN UNTIL THE FIRST FULL CREW DAY.

SYSHK1/TIME,                    00:16:00
SYSHK1/ENABLE,  SUPPER,        -00:02:00,-00:02:00

SYSHK1/COMMNT,      ASSUMPTION: SIX HOURS OF SYSTEMS HOUSEKEEPING PER DAY
SYSHK1/COMMNT,          IS SUFFICIENT, DIVIDED EVENLY AMONG THE CREWMEN.

SYSHK1/RES,     CREW A,        00:00:00, 00:02:00


SYSHK2/TITLE,      SYSTEMS HOUSEKEEPING

SYSHK2/PRI,     11
SYSHK2/OBJEC,   1,60,

SYSHK2/COMMNT,      ASSUMPTION: THE STANDARD CYCLE OF SYSTEMS HOUSEKEEPING
SYSHK2/COMMNT,          TASKS DOES NOT BEGIN UNTIL THE FIRST FULL CREW DAY.

SYSHK2/TIME,                    00:16:00
SYSHK2/ENABLE,  BREAK,         00:01:30, 00:02:00

SYSHK2/COMMNT,      ASSUMPTION: SIX HOURS OF SYSTEMS HOUSEKEEPING PER DAY
SYSHK2/COMMNT,          IS SUFFICIENT, DIVIDED EVENLY AMONG THE CREWMEN.

SYSHK2/RES,     CREW B,        00:00:00, 00:02:00


SYSHK3/TITLE,      SYSTEMS HOUSEKEEPING

SYSHK3/PRI,     19

SYSHK3/COMMNT,      ASSUMPTION: EVA TAKES PRECEDENCE OVER SYSTEMS HOUSE-
SYSHK3/COMMNT,          KEEPING.

SYSHK3/OBJEC,   1,60

SYSHK3/COMMNT,      ASSUMPTION: THE STANDARD CYCLE OF SYSTEMS HOUSEKEEPING
SYSHK3/COMMNT,          TASKS DOES NOT BEGIN UNTIL THE FIRST FULL CREW DAY.
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PRELIMINARY EXPERIMENT DATA BASE

```
SYSHK3/TIME,                    00:16:00
SYSHK3/ENABLE, LUNCH,           00:01:15, 00:01:15

SYSHK3/COMMNT,      ASSUMPTION: SIX HOURS OF SYSTEMS HOUSEKEEPING PER DAY
SYSHK3/COMMNT,          IS SUFFICIENT, DIVIDED EVENLY AMONG THE CREWMEN.

SYSHK3/RES,     CREW C,         00:00:00, 00:02:00


EVA1  /TITLE,      D021/D024 EVA

EVA1  /PRI,    5
EVA1  /OBJEC,  1,1

EVA1  /COMMNT,     EVA1 IS REQUIRED ON THE SEVENTEENTH MISSION DAY.

EVA1  /TIME,                    17:02:20, 18:00:00

EVA1  /COMMNT,     THE TIME REQUIREMENT OF 17:02:20 PERMITS EVA1 TO BE
EVA1  /COMMNT,         SCHEDULED DURING THE AFTERNOON PORTION OF THE
EVA1  /COMMNT,         CREW DAY, IRRESPECTIVE OF THE PHASING OF
EVA1  /COMMNT,         SUNRISE IN THIS ORBIT.

EVA1  /COMMNT,     THE START TIME OF EVA1 OCCURS AT HATCH OPENING.

EVA1  /COMMNT,     ASSUMPTION: THE HATCH IS OPENED AT SUNRISE.

EVA1  /RES,    (NOT)DAY,   -00:00:10, 00:00:00
EVA1  /RES,    DAY,         00:00:00, 00:00:50

EVA1  /COMMNT,     A DURATION OF THREE HOURS FOR THE EVA IS ASSUMED;
EVA1  /COMMNT,         APPROXIMATELY 45 MINUTES OF THIS TIME ARE
EVA1  /COMMNT,         DEVOTED TO D021 AND D024.

EVA1  /RES,    CREW A,     -00:02:15, 00:03:45
EVA1  /RES,    CREW B,     -00:02:15, 00:03:45
EVA1  /RES,    CREW C,     -00:00:45, 00:03:45


EVA2  /TITLE,      ATM FILM-RETRIEVAL EVA

EVA2  /PRI,    6

EVA2  /OBJEC,  1,1

EVA2  /COMMNT,     EVA2 IS REQUIRED ON THE TWENTY-SIXTH MISSION DAY.

EVA2  /TIME,                    26:02:20, 27:00:00

EVA2  /COMMNT,     THE TIME REQUIREMENT OF 26:02:20 PERMITS EVA2 TO BE
EVA2  /COMMNT,         SCHEDULED DURING THE AFTERNOON PORTION OF THE
EVA2  /COMMNT,         CREW DAY, IRRESPECTIVE OF THE PHASING OF
EVA2  /COMMNT,         SUNRISE IN THIS ORBIT.

EVA2  /COMMNT,     THE START TIME OF EVA2 OCCURS AT HATCH OPENING.

EVA2  /COMMNT,     ASSUMPTION: THE HATCH IS OPENED AT SUNRISE.
```

PRELIMINARY EXPERIMENT DATA BASE

```
EVA2  /RES,    (NOT)DAY,      -00:00:10, 00:00:00
EVA2  /RES,    DAY,            00:00:00, 00:00:50

EVA2  /COMMNT,   A DURATION OF THREE HOURS FOR THE EVA IS ASSUMED.

EVA2  /RES,    CREW A,        -00:02:15, 00:03:45
EVA2  /RES,    CREW B,        -00:02:15, 00:03:45
EVA2  /RES,    CREW C,        -00:00:45, 00:03:45


D008A /TITLE,    RADIATION IN SPACECRAFT
D008A /TITLE,        MEASUREMENTS WITHIN THE SOUTH ATLANTIC ANOMALY

D008A /PRI,    121
D008A /OBJEC,  1,4

D008A /COMMNT,   ASSUMPTION: NO EXPERIMENTS ARE TO BE SCHEDULED BEFORE
D008A /COMMNT,       THE MORNING OF THE SECOND FULL CREW DAY OR AFTER
D008A /COMMNT,       THE END OF THE TWENTY-FIFTH MISSION DAY TO
D008A /COMMNT,       PERMIT TIME FOR CLUSTER ACTIVATION AND DEACTIVA-
D008A /COMMNT,       TION, RESPECTIVELY.

D008A /COMMNT,   THIS TIME REQUIREMENT APPLIES TO ALL EXPERIMENT TASKS.

D008A /TIME,              01:16:00, 26:00:00

D008A /COMMNT,   FOURTEEN ONE-MINUTE RECORDING INTERVALS ARE REQUIRED
D008A /COMMNT,       PER TRIAL; ONE MINUTE IS ADDED TO THIS TIME
D008A /COMMNT,       ARBITRARILY.

D008A /COMMNT,   NOSA IS THE NAME ON THE EPHEMERIS TAPE FOR THE
D008A /COMMNT,       REGION OUTSIDE THE SOUTH ATLANTIC ANOMALY.

D008A /RES,    (NOT)NOSA,     00:00:00, 00:00:15
D008A /RES,    ANY,           00:00:00, 00:00:15


D008B /TITLE,    RADIATION IN SPACECRAFT
D008B /TITLE,        MEASUREMENTS OUTSIDE THE SOUTH ATLANTIC ANOMALY

D008B /PRI,    122
D008B /OBJEC,  1,4
D008B /TIME,              01:16:00, 26:00:00

D008B /COMMNT,   THIRTEEN TWO-MINUTE RECORDING INTERVALS ARE REQUIRED
D008B /COMMNT,       PER TRIAL; ONE MINUTE IS ADDED TO THIS TIME
D008B /COMMNT,       ARBITRARILY.

D008B /RES,    NOSA,          00:00:00, 00:00:27
D008B /RES,    ANY,           00:00:00, 00:00:27

D008B /COMMNT,   D008B SHOULD BE CENTERED ABOUT THE HIGHEST LATITUDE
D008B /COMMNT,       OF THE SPACECRAFT ORBIT; NO PROVISION IS MADE
D008B /COMMNT,       TO SCHEDULE THE EXPERIMENT THIS WAY WITH THE
D008B /COMMNT,       PRESENT EPHEMERIS TAPE.
```

PRELIMINARY EXPERIMENT DATA BASE

D021A /TITLE,   EXPANDABLE AIRLOCK TECHNOLOGY
D021A /TITLE,   AIRLOCK DEPLOYMENT AND PROOF PRESSURE TEST

D021A /PRI,   109
D021A /OBJEC,   1,1

D021A /COMMNT,   D021A MUST BE COMPLETED 15 DAYS BEFORE THE START OF
D021A /COMMNT,   EVA1 TO ALLOW FOR THE 15-DAY LEAKAGE TEST -- THE
D021A /COMMNT,   MINUS 16 DAYS ON THE ENABLE CARD IS ARBITRARY.

D021A /ENABLE, EVA1,   -16:00:00,-15:00:00

D021A /COMMNT,   ASSUMPTION: DEPLOYMENT MUST BE DONE DURING A DAYLIGHT
D021A /COMMNT,   PASS TO PERMIT PHOTOGRAPHY.

D021A /RES,   DAY,   00:00:00, 00:00:07
D021A /RES,   ANY1,   00:00:00, 00:00:07
D021A /RES,   ANY2,   00:00:00, 00:00:07

D021C /TITLE,   EXPANDABLE AIRLOCK TECHNOLOGY
D021C /TITLE,   WORKING PRESSURE TEST

D021C /PRI,   110
D021C /OBJEC,   1,1
D021C /TIME,   01:16:00, 26:00:00

D021C /COMMNT,   D021C MUST FOLLOW EVA1.

D021C /ENABLE, EVA1,   00:03:45
D021C /RES,   ANY1,   00:00:00, 00:00:10
D021C /RES,   ANY2,   00:00:00, 00:00:10

M092T0/TITLE,   IN-FLIGHT LOWER BODY NEGATIVE PRESSURE (LBNP)

M092T0/PRI,   0

M092T0/COMMNT,   FIVE TRIALS PER SUBJECT ARE REQUIRED; TRIALS ARE
M092T0/COMMNT,   ARBITRARILY SCHEDULED EVERY FIFTH OR SIXTH DAY.

M092T0/OBJEC, 5,5,   05:00:00, MIN

M092T0/COMMNT,   THE TIME CARD EXCLUDES DAYS ON WHICH M092 WOULD
M092T0/COMMNT,   CONFLICT WITH DESIRED SCHEDULING OF M093.

M092T0/TIME,   01:16:00, 07:00:00, 08:00:00, 13:00:00,
                            14:00:00, 24:00:00, 25:00:00, 26:00:00

M092T0/COMMNT,   TEST PHASES OF M092 MUST BE PRECEDED BY AT LEAST
M092T0/COMMNT,   THREE HOURS OF FASTING BY THE SUBJECT.

M092T0/COMMNT,   M092 TRIALS ARE SCHEDULED BETWEEN THREE AND SIX HOURS
M092T0/COMMNT,   AFTER LUNCH TO PUT THEM AT APPROXIMATELY THE
M092T0/COMMNT,   SAME TIME OF DAY FOR EACH SUBJECT.

PRELIMINARY EXPERIMENT DATA BASE

```
M092T0/ENABLE,  LUNCH,            00:04:15,  00:07:15

M092T0/COMMNT,      THE START TIME IS ARBITRARILY PLACED AT THE BEGINNING
M092T0/COMMNT,          OF THE TEST PHASES, AFTER THE PREPARATION PHASE.

M092T0/COMMNT,      ASSUMPTION: THE ESS IS OCCUPIED THROUGHOUT THE TRIAL;
M092T0/COMMNT,          THE ESS IS ACTUALLY REQUIRED FOR EXPERIMENT
M092T0/COMMNT,          SUPPORT ONLY DURING TEST PHASES.

M092T0/RES,     ESS,           -00:00:25,  00:00:43
M092T0/RES,     EXPONE,         00:00:00,  00:00:28
M092T0/RES,     EXPTWO,         00:00:00,  00:00:28


M092T1/EQUIV,   M092T0

M092T1/TITLE,             TRIALS FOR THE FIRST SUBJECT

M092T1/PRI,     20
M092T1/TIME,                 01:16:00, 07:00:00, 08:00:00, 13:00:00,
                             14:00:00, 26:00:00

M092T1/COMMNT,      ASSUMPTION: TEST PHASES OF M092 MUST NOT BE PRECEDED
M092T1/COMMNT,          BY STRESS OR VIGOROUS EXERCISE BY THE SUBJECT
M092T1/COMMNT,          WITHIN TWO HOURS; TEST PHASES OF M093, M131 -
M092T1/COMMNT,          MODE A, AND M171 ARE INCLUDED AS STRESS OR
M092T1/COMMNT,          EXERCISE FOR THIS PURPOSE.

M092T1/INHIB,   M171A1,         00:00:00,  00:02:30
M092T1/INHIB,   M171B1,         00:00:00,  00:02:40
M092T1/INHIB,   M171C1,         00:00:00,  00:03:10

M092T1/COMMNT,      SOME INHIBITS ARE INCLUDED UNDER M093 AND M131.

M092T1/RES,     CREW A,        -00:00:25,  00:00:51
M092T1/RES,     CREW C,        -00:00:25,  00:00:43

M092T1/COMMNT,      ASSUMPTION: CREWMAN C IS TRAINED TO BE THE OBSERVER
M092T1/COMMNT,          WHEN EITHER OF THE OTHER CREWMEN IS THE SUBJECT.


M092T2/EQUIV,   M092T0

M092T2/TITLE,             TRIALS FOR THE SECOND SUBJECT

M092T2/PRI,     21

M092T2/COMMNT,      SEE COMMENT ON PREVIOUS EXERCISE UNDER M092T1.

M092T2/INHIB,   M171A2,         00:00:00,  00:02:30
M092T2/INHIB,   M171B2,         00:00:00,  00:02:40
M092T2/INHIB,   M171C2,         00:00:00,  00:03:10

M092T2/COMMNT,      SOME INHIBITS ARE INCLUDED UNDER M093 AND M131.

M092T2/RES,     CREW B,        -00:00:25,  00:00:51
M092T2/RES,     CREW C,        -00:00:25,  00:00:43
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PRELIMINARY EXPERIMENT DATA BASE

M092T2/COMMNT,   ASSUMPTION: CREWMAN C IS TRAINED TO BE THE OBSERVER
M092T2/COMMNT,   WHEN EITHER OF THE OTHER CREWMEN IS THE SUBJECT.

M092T3/EQUIV,   M092T0

M092T3/TITLE,   TRIALS FOR THE THIRD SUBJECT

M092T3/PRI,   22

M092T3/COMMNT,   SEE COMMENT ON PREVIOUS EXERCISE UNDER M092T1.

M092T3/COMMNT,   INHIBITS ARE INCLUDED UNDER M093, M131, AND M171.

M092T3/RES,   CREW C,   -00:00:25, 00:00:51
M092T3/RES,   CREW B,   -00:00:25, 00:00:43

M092T3/COMMNT,   ASSUMPTION: CREWMAN B IS TRAINED TO BE THE OBSERVER
M092T3/COMMNT,   WHEN CREWMAN C IS THE SUBJECT.

M092T0/DELETE

M093T0/TITLE,   VECTORCARDIOGRAM

M093T0/PRI,   0

M093T0/COMMNT,   TRIALS OF M093 MUST BE PERFORMED EVERY THIRD DAY FOR
M093T0/COMMNT,   EACH SUBJECT. A TOLERANCE OF PLUS OR MINUS NINE
M093T0/COMMNT,   HOURS ON THE START TIME IS ARBITRARY, DESIGNED
M093T0/COMMNT,   TO PERMIT FLEXIBILITY ONLY IN THE TIME OF DAY
M093T0/COMMNT,   FOR THE START OF EACH REPETITION.

M093T0/OBJEC,   1,20,   03:00:00, 00:09:00
M093T0/TIME,   01:16:00, 26:00:00

M093T0/COMMNT,   TEST PHASES OF M093 MUST BE PRECEDED BY AT LEAST
M093T0/COMMNT,   THREE HOURS OF FASTING BY THE SUBJECT.

M093T0/COMMNT,   M093 TRIALS ARE SCHEDULED BETWEEN THREE AND SIX HOURS
M093T0/COMMNT,   AFTER LUNCH BY CHOICE, BASED ON THE SCHEDULING
M093T0/COMMNT,   OF OTHER MEDICAL EXPERIMENTS IN THE DATA BASE.

M093T0/ENABLE,   LUNCH,   00:04:15, 00:07:15

M093T0/COMMNT,   THE START TIME IS ARBITRARILY PLACED AT THE BEGINNING
M093T0/COMMNT,   OF THE TEST PHASES, AFTER THE PREPARATION PHASE.

M093T0/COMMNT,   TEST PHASES OF M093 MUST NOT BE PRECEDED BY TEST
M093T0/COMMNT,   PHASES OF M092, M131, M171, OR VIGOROUS EXERCISE
M093T0/COMMNT,   BY THE SAME SUBJECT WITHIN THIRTY MINUTES.

M093T0/COMMNT,   SOME INHIBITS ARE INCLUDED UNDER M131; OTHER INHIBITS
M093T0/COMMNT,   ARE NOT NEEDED BECAUSE OF PREPARATION AND POST-
M093T0/COMMNT,   EXPERIMENT TIMES REQUIRED OF THE SUBJECT.

PRELIMINARY EXPERIMENT DATA BASE

M093T0/COMMNT,   ASSUMPTION: THE ESS IS OCCUPIED THROUGHOUT THE TRIAL;
M093T0/COMMNT,   THE ESS IS ACTUALLY REQUIRED FOR EXPERIMENT
M093T0/COMMNT,   SUPPORT ONLY DURING TEST PHASES.

M093T0/RES,   ESS,   -00:00:15, 00:00:24
M093T0/RES,   EXPONE,   00:00:00, 00:00:17
M093T0/RES,   EXPTWO,   00:00:00, 00:00:17

M093T1/EQUIV,   M093T0

M093T1/TITLE,   TRIALS FOR THE FIRST SUBJECT

M093T1/PRI,   23

M093T1/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M093T1/INHIB,   M092T1,   -00:02:17, 00:00:00
M093T1/INHIB,   M171A1,   -00:02:17, 00:00:00
M093T1/INHIB,   M171F1,   -00:02:17, 00:00:00
M093T1/INHIB,   M171C1,   -00:02:17, 00:00:00

M093T1/RES,   CREW A,   -00:00:15, 00:00:24
M093T1/RES,   ANY,   -00:00:15, 00:00:00

M093T2/EQUIV,   M093T0

M093T2/TITLE,   TRIALS FOR THE SECOND SUBJECT

M093T2/PRI,   24

M093T2/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M093T2/INHIB,   M092T2,   -00:02:17, 00:00:00
M093T2/INHIB,   M171A2,   -00:02:17, 00:00:00
M093T2/INHIB,   M171B2,   -00:02:17, 00:00:00
M093T2/INHIB,   M171C2,   -00:02:17, 00:00:00

M093T2/RES,   CREW B,   -00:00:15, 00:00:24
M093T2/RES,   ANY,   -00:00:15, 00:00:00

M093T3/EQUIV,   M093T0

M093T3/TITLE,   TRIALS FOR THE THIRD SUBJECT

M093T3/PRI,   25

M093T3/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M093T3/INHIB,   M092T3,   -00:02:17, 00:00:00

M093T3/RES,   CREW C,   -00:00:15, 00:00:24
M093T3/RES,   ANY,   -00:00:15, 00:00:00

M093T0/DELETE

PRELIMINARY EXPERIMENT DATA BASE

M131A0/TITLE,   HUMAN VESTIBULAR FUNCTION
M131A0/TITLE,   MODE A - SEMICIRCULAR CANAL TEST

M131A0/PRI,   0

M131A0/COMMNT,   REPETITIONS FOR EACH SUBJECT SHOULD BE NO CLOSER THAN
M131A0/COMMNT,   EVERY SECOND DAY, EVENLY SPACED.

M131A0/COMMNT,   THE MINIMUM FREQUENCY OF TWO DAYS IS SELECTED FOR
M131A0/COMMNT,   EACH SUBJECT. A TOLERANCE OF PLUS OR MINUS NINE
M131A0/COMMNT,   HOURS ON THE START TIME IS ARBITRARY, DESIGNED
M131A0/COMMNT,   TO PERMIT FLEXIBILITY ONLY IN THE TIME OF DAY
M131A0/COMMNT,   FOR THE START OF EACH REPETITION.

M131A0/OBJEC,   3,3,   02:00:00, 00:09:00

M131A0/COMMNT,   A TIME REQUIREMENT OF TEN DAYS IS SELECTED AS AN
M131A0/COMMNT,   ARBITRARY MAXIMUM FOR THE THREE TRIALS PER
M131A0/COMMNT,   SUBJECT TO BE SCHEDULED EARLY IN THE MISSION.

M131A0/TIME,   01:16:00, 10:00:00

M131A0/COMMNT,   EACH TRIAL MUST BE PRECEDED BY AT LEAST ONE HOUR OF
M131A0/COMMNT,   FASTING BY THE SUBJECT.

M131A0/INHIB,   BREAK,   00:00:00, 00:02:30
M131A0/INHIB,   LUNCH,   00:00:00, 00:02:15

M131A0/RES,   ESS,   00:00:00, 00:00:30
M131A0/RES,   EXPONE,   00:00:00, 00:00:30

M131A1/EQUIV,   M131A0

M131A1/TITLE,   TRIALS FOR THE FIRST SUBJECT

M131A1/COMMNT,   THREE TRIALS EARLY IN THE MISSION

M131A1/PRI,   29

M131A1/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M131A1/INHIB,   M092T1,   -00:02:30, 00:00:00
M131A1/INHIB,   M093T1,   -00:01:00, 00:00:00

M131A1/RES,   CREW A,   00:00:00, 00:00:30
M131A1/RES,   ANY,   00:00:00, 00:00:30

M131A2/EQUIV,   M131A0

M131A2/TITLE,   3   TRIALS FOR THE SECOND SUBJECT

M131A2/COMMNT,   THREE TRIALS EARLY IN THE MISSION

PRELIMINARY EXPERIMENT DATA BASE

M131A2/PRI,   30

M131A2/COMMNT,   ALL THREE CREWMEN SHOULD ACT AS SUBJECT WITHIN A
M131A2/COMMNT,   SIXTEEN-HOUR PERIOD.

M131A2/ENABLE, M131A1,   -00:16:00, 00:16:00

M131A2/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M131A2/INHIB,   M092T2,   -00:02:30, 00:00:00
M131A2/INHIB,   M093T2,   -00:01:00, 00:00:00

M131A2/RES,   CREW B,   00:00:00, 00:00:30
M131A2/RES,   ANY,   00:00:00, 00:00:30

M131A3/EQUIV,   M131A0

M131A3/TITLE,   TRIALS FOR THE THIRD SUBJECT

M131A3/COMMNT,   THREE TRIALS EARLY IN THE MISSION

M131A3/PRI,   31

M131A3/COMMNT,   ALL THREE CREWMEN SHOULD ACT AS SUBJECT WITHIN A
M131A3/COMMNT,   SIXTEEN-HOUR PERIOD.

M131A3/ENABLE, M131A1,   -00:16:00, 00:16:00
M131A3/ENABLE, M131A2,   -00:16:00, 00:16:00

M131A3/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M131A3/INHIB,   M092T3,   -00:02:30, 00:00:00
M131A3/INHIB,   M093T3,   -00:01:00, 00:00:00

M131A3/RES,   CREWC,   00:00:00, 00:00:30
M131A3/RES,   ANY,   00:00:00, 00:00:30

M131A4/EQUIV,   M131A1

M131A4/COMMNT,   THREE TRIALS LATE IN THE MISSION

M131A4/PRI,   32

M131A4/COMMNT,   A TIME REQUIREMENT OF TWENTY DAYS IS SELECTED AS AN
M131A4/COMMNT,   ARBITRARY MINIMUM FOR THE THREE TRIALS PER
M131A4/COMMNT,   SUBJECT TO BE SCHEDULED LATE IN THE MISSION.

M131A4/TIME,   20:00:00, 26:00:00

M131A5/EQUIV,   M131A2
M131A5/PRI,   33

M131A5/COMMNT,   SEE COMMENT ON TIME UNDER M131A4.

PRELIMINARY EXPERIMENT DATA BASE

M131A5/TIME,   20:00:00, 26:00:00

M131A6/EQUIV,   M131A3

M131A6/PRI,   34

M131A6/COMMNT,   SEE COMMENT ON TIME UNDER M131A4.

M131A6/TIME,   20:00:00, 26:00:00

M131A0/DELETE

M131B0/TITLE,   HUMAN VESTIBULAR FUNCTION
M131B0/TITLE,   MODE B - SPATIAL LOCALIZATION TEST

M131B0/PRI,   0

M131B0/COMMNT,   TRIALS SHOULD BE SCHEDULED EARLY, MIDDLE, AND LATE
M131B0/COMMNT,   IN THE MISSION FOR EACH SUBJECT; A FREQUENCY OF
M131B0/COMMNT,   NINE DAYS IS COMPLETELY ARBITRARY.

M131B0/OBJEC,   3,3,   09:00:00, 01:00:00
M131B0/TIME,   01:16:00, 26:00:00

M131B0/COMMNT,   EACH TRIAL MUST BE PRECEDED BY AT LEAST ONE HOUR OF
M131B0/COMMNT,   FASTING BY THE SUBJECT.

M131B0/INHIB,   BREAK,   00:00:00, 00:02:30
M131B0/INHIB,   LUNCH,   00:00:00, 00:02:15

M131B0/RES,   ESS,   00:00:00, 00:00:45
M131B0/RES,   EXPONE,   00:00:00, 00:00:45

M131B1/EQUIV,   M131B0

M131B1/TITLE,   TRIALS FOR THE FIRST SUBJECT

M131B1/PRI,   35

M131B1/COMMNT,   MODE B SHOULD NOT BE CONDUCTED ON THE SAME DAY AS
M131B1/COMMNT,   MODE A FOR THE SAME CREWMAN.

M131B1/INHIB,   M131A1,   -00:12:00, 00:12:00
M131B1/INHIB,   M131A4,   -00:12:00, 00:12:00

M131B1/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M131B1/INHIB,   M093T1,   -00:01:15, 00:00:00

M131B1/RES,   CREW A,   00:00:00, 00:00:45
M131B1/RES,   ANY,   00:00:00, 00:00:45

M131B2/EQUIV,   M131B0

PRELIMINARY EXPERIMENT DATA BASE

M131B2/TITLE,   TRIALS FOR THE SECOND SUBJECT

M131B2/PRI,   36

M131B2/COMMNT,   ALL THREE CREWMEN SHOULD ACT AS SUBJECT WITHIN A
M131B2/COMMNT,   SIXTEEN-HOUR PERIOD.

M131B2/ENABLE, M131B1,   -00:16:00, 00:16:00

M131B2/COMMNT,   MODE B SHOULD NOT BE CONDUCTED ON THE SAME DAY AS
M131B2/COMMNT,   MODE A FOR THE SAME CREWMAN.

M131B2/INHIB,   M131A2,   -00:12:00, 00:12:00
M131B2/INHIB,   M131A5,   -00:12:00, 00:12:00

M131B2/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M131B2/INHIB,   M093T2,   -00:01:15, 00:00:00

M131B2/RES,   CREW B,   00:00:00, 00:00:45
M131B2/RES,   ANY,   00:00:00, 00:00:45

M131B3/EQUIV,   M131B0

M131B3/TITLE,   TRIALS FOR THE THIRD SUBJECT

M131B3/PRI,   37

M131B3/COMMNT,   ALL THREE CREWMEN SHOULD ACT AS SUBJECT WITHIN A
M131B3/COMMNT,   SIXTEEN-HOUR PERIOD.

M131B3/ENABLE, M131B1,   -00:16:00, 00:16:00
M131B3/ENABLE, M131B2,   -00:16:00, 00:16:00

M131B3/COMMNT,   MODE B SHOULD NOT BE CONDUCTED ON THE SAME DAY AS
M131B3/COMMNT,   MODE A FOR THE SAME CREWMAN.

M131B3/INHIB,   M131A3,   -00:12:00, 00:12:00
M131B3/INHIB,   M131A6,   -00:12:00, 00:12:00

M131B3/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M131B3/INHIB,   M093T3,   -00:01:15, 00:00:00

M131B3/RES,   CREW C,   00:00:00, 00:00:45
M131B3/RES,   ANY,   00:00:00, 00:00:45

M131B0/DELETE

M171A0/TITLE,   M171 - METABOLIC ACTIVITY
M171A0/TITLE,   MODE A - RESTING METABOLIC RATE AND BICYCLE ERGOMETRY

M171A0/PRI,   0

PRELIMINARY EXPERIMENT DATA BASE

```
M171A0/COMMNT,     TRIALS SHOULD BE SCHEDULED EARLY, MIDDLE, AND LATE IN
M171A0/COMMNT,         THE MISSION FOR EACH SUBJECT; A MINIMUM TIME OF
M171A0/COMMNT,         EIGHT DAYS BETWEEN TRIALS IS ARBITRARY.

M171A0/OBJEC,  3,3,            08:00:00, MIN
M171A0/TIME,                   01:16:00, 26:00:00

M171A0/COMMNT,     ASSUMPTION: THE ESS IS OCCUPIED THROUGHOUT THE TRIAL;
M171A0/COMMNT,         THE ESS IS ACTUALLY REQUIRED FOR EXPERIMENT
M171A0/COMMNT,         SUPPORT ONLY DURING TEST PHASES.

M171A0/RES,    ESS,           -00:00:30, 00:01:00

M171A0/COMMNT,     THE START TIME IS ARBITRARILY PLACED AT THE BEGINNING
M171A0/COMMNT,         OF THE TEST PHASES, AFTER THE PREPARATION PHASE.

M171A0/RES,    EXPONE,        00:00:00, 00:00:30


M171A1/EQUIV,  M171A0

M171A1/TITLE,              TRIALS FOR THE FIRST SUBJECT

M171A1/PRI,    12

M171A1/COMMNT,     TEST PHASES OF M171 - MODE A MUST BE PRECEDED BY AT
M171A1/COMMNT,         LEAST THREE HOURS OF FASTING BY THE SUBJECT.

M171A1/COMMNT,     ALL MODES OF M171 FOR THE SAME SUBJECT MUST BE
M171A1/COMMNT,         SCHEDULED AT APPROXIMATELY THE SAME TIME OF DAY.

M171A1/ENABLE, BREAK,         00:04:30, 00:05:00

M171A1/COMMNT,     A LATE 'MORNING' OPPORTUNITY IS SELECTED ARBITRARILY.

M171A1/COMMNT,     TEST PHASES OF M093 MUST NOT OCCUR LESS THAN THREE
M171A1/COMMNT,         HOURS PRIOR TO TEST PHASES OF M171.

M171A1/COMMNT,     SOME INHIBITS ARE INCLUDED UNDER M093.
M171A1/COMMNT,     SOME INHIBITS ARE INCLUDED UNDER LUNCH.

M171A1/RES,    CREW A,        -00:00:30, 00:01:00
M171A1/RES,    ANY,           00:00:00, 00:00:30


M171A2/EQUIV,  M171A0

M171A2/TITLE,              TRIALS FOR THE SECOND SUBJECT

M171A2/PRI,    15

M171A2/COMMNT,     TEST PHASES OF M171 - MODE A MUST BE PRECEDED BY AT
M171A2/COMMNT,         LEAST THREE HOURS OF FASTING BY THE SUBJECT.

M171A2/COMMNT,     ALL MODES OF M171 FOR THE SAME SUBJECT MUST BE
M171A2/COMMNT,         SCHEDULED AT APPROXIMATELY THE SAME TIME OF DAY.
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PRELIMINARY EXPERIMENT DATA BASE

M171A2/ENABLE, BREAK,   00:04:30, 00:05:00

M171A2/COMMNT,   A LATE 'MORNING' OPPORTUNITY IS SELECTED ARBITRARILY.

M171A2/COMMNT,   TEST PHASES OF M093 MUST NOT OCCUR LESS THAN THREE
M171A2/COMMNT,   HOURS PRIOR TO TEST PHASES OF M171.

M171A2/COMMNT,   SOME INHIBITS ARE INCLUDED UNDER M093.
M171A2/COMMNT,   SOME INHIBITS ARE INCLUDED UNDER LUNCH.

M171A2/RES,   CREW B,   -00:00:30, 00:01:00
M171A2/RES,   ANY,   00:00:00, 00:00:30

M171A3/EQUIV, M171A0

M171A3/TITLE,   TRIALS FOR THE THIRD SUBJECT

M171A3/PRI,   26

M171A3/COMMNT,   TEST PHASES OF M171 - MODE A MUST BE PRECEDED BY AT
M171A3/COMMNT,   LEAST THREE HOURS OF FASTING BY THE SUBJECT.

M171A3/COMMNT,   ALL MODES OF M171 FOR THE SAME SUBJECT MUST BE
M171A3/COMMNT,   SCHEDULED AT APPROXIMATELY THE SAME TIME OF DAY.

M171A3/ENABLE, LUNCH,   00:04:15, 00:07:15

M171A3/COMMNT,   A LATE 'AFTERNOON' OPPORTUNITY IS SELECTED ARBITRARILY.

M171A3/COMMNT,   TEST PHASES OF M093 MUST NOT OCCUR LESS THAN THREE
M171A3/COMMNT,   HOURS PRIOR TO TEST PHASES OF M171.

M171A3/INHIB, M093T3,   00:00:00, 00:02:17

M171A3/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M171A3/INHIB, M092T3,   -00:02:30, 00:00:00

M171A3/RES,   CREW C,   -00:00:30, 00:01:00
M171A3/RES,   ANY,   00:00:00, 00:00:30

M171A0/DELETE

M171B0/TITLE,   METABOLIC ACTIVITY
M171B0/TITLE,   MODE B - UNSUITED MAINTENANCE AND CONSTANT WORK TASKS

M171B0/COMMNT,   MODE B HAS RECENTLY BEEN CANCELLED BY MSC AND WILL BE
M171B0/COMMNT,   DELETED FROM THE DATA BASE ALONG WITH A
M171B0/COMMNT,   RESTRUCTURING OF THE TASK DESCRIPTIONS FOR
M171B0/COMMNT,   MEDICAL EXPERIMENTS.

M171B0/PRI,   0

M171B0/COMMNT,   TRIALS SHOULD BE SCHEDULED EARLY, MIDDLE, AND LATE IN
M171B0/COMMNT,   THE MISSION FOR EACH SUBJECT; A MINIMUM TIME OF
M171B0/COMMNT,   EIGHT DAYS BETWEEN TRIALS IS ARBITRARY.

PRELIMINARY EXPERIMENT DATA BASE

```
M171B0/OBJEC,    3,3,            08:00:00, MIN
M171B0/TIME,                     01:16:00, 26:00:00

M171B0/COMMNT,      ASSUMPTION: THE ESS IS OCCUPIED THROUGHOUT THE TRIAL;
M171B0/COMMNT,          THE ESS IS ACTUALLY REQUIRED FOR EXPERIMENT
M171B0/COMMNT,          SUPPORT ONLY DURING TEST PHASES.

M171B0/RES,      ESS,           -00:00:30, 00:00:55

M171B0/COMMNT,      THE START TIME IS ARBITRARILY PLACED AT THE BEGINNING
M171B0/COMMNT,          OF THE TEST PHASES, AFTER THE PREPARATION PHASE.

M171B0/RES,      EXPONE,        00:00:00, 00:00:40


M171B1/EQUIV,    M171B0

M171B1/TITLE,               TRIALS FOR THE FIRST SUBJECT

M171B1/PRI,      13

M171B1/COMMNT,      ALL MODES OF M171 FOR THE SAME SUBJECT MUST BE
M171B1/COMMNT,          SCHEDULED AT APPROXIMATELY THE SAME TIME OF DAY.

M171B1/ENABLE,   BREAK,         00:04:30, 00:05:00

M171B1/COMMNT,      A LATE 'MORNING' OPPORTUNITY IS SELECTED ARBITRARILY.

M171B1/COMMNT,      TEST PHASES OF M093 MUST NOT OCCUR LESS THAN THREE
M171B1/COMMNT,          HOURS PRIOR TO TEST PHASES OF M171.

M171B1/COMMNT,      INHIBITS ARE INCLUDED UNDER M093.

M171B1/RES,      CREW A,        -00:00:30, 00:00:55
M171B1/RES,      ANY,           00:00:00, 00:00:40


M171B2/EQUIV,    M171B0

M171B2/TITLE,               TRIALS FOR THE SECOND SUBJECT

M171B2/PRI,      16

M171B2/COMMNT,      ALL MODES OF M171 FOR THE SAME SUBJECT MUST BE
M171B2/COMMNT,          SCHEDULED AT APPROXIMATELY THE SAME TIME OF DAY.

M171B2/ENABLE,   BREAK,         00:04:30, 00:05:00

M171B2/COMMNT,      A LATE 'MORNING' OPPORTUNITY IS SELECTED ARBITRARILY.

M171B2/COMMNT,      TEST PHASES OF M093 MUST NOT OCCUR LESS THAN THREE
M171B2/COMMNT,          HOURS PRIOR TO TEST PHASES OF M171.

M171B2/COMMNT,      INHIBITS ARE INCLUDED UNDER M093.

M171B2/RES,      CREW B,        -00:00:30, 00:00:55
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PRELIMINARY EXPERIMENT DATA BASE

```
M171B2/RES,       ANY,              00:00:00, 00:00:40


M171B3/EQUIV,   M171B0


M171B3/TITLE,               TRIALS FOR THE THIRD SUBJECT


M171B3/PRI,     27
M171B3/TIME,                        01:16:00, 24:00:00, 25:00:00, 26:00:00

M171B3/COMMNT,      ALL MODES OF M171 FOR THE SAME SUBJECT MUST BE
M171B3/COMMNT,              SCHEDULED AT APPROXIMATELY THE SAME TIME OF DAY.

M171B3/ENABLE,  LUNCH,              00:04:15, 00:07:15

M171B3/COMMNT,      A LATE 'AFTERNOON' OPPORTUNITY IS SELECTED ARBITRARILY.

M171B3/COMMNT,      TEST PHASES OF M093 MUST NOT OCCUR LESS THAN THREE
M171B3/COMMNT,              HOURS PRIOR TO TEST PHASES OF M171.

M171S3/INHIB,   M092T3,             00:00:00, 00:02:17

M171B3/COMMNT,      THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M171B3/INHIB,   M092T3,            -00:02:40, 00:00:00

M171B3/RES,     CREW C,            -00:00:30, 00:00:55
M171B3/RES,     ANY,                00:00:00, 00:00:40

M171B0/DELETE


M171C0/TITLE,      METABOLIC ACTIVITY
M171C0/TITLE,      MODE C - SUITED MAINTENANCE AND CONSTANT WORK TASKS

M171C0/COMMNT,     MODE C HAS RECENTLY BEEN CANCELLED BY MSC AND WILL BE
M171C0/COMMNT,             DELETED FROM THE DATA BASE ALONG WITH A
M171C0/COMMNT,             RESTRUCTURING OF THE TASK DESCRIPTIONS FOR
M171C0/COMMNT,             MEDICAL EXPERIMENTS.

M171C0/PRI,     0

M171C0/COMMNT,     TRIALS SHOULD BE SCHEDULED EARLY, MIDDLE, AND LATE IN
M171C0/COMMNT,             THE MISSION FOR EACH SUBJECT; A MINIMUM TIME OF
M171C0/COMMNT,             EIGHT DAYS BETWEEN TRIALS IS ARBITRARY.

M171C0/OBJEC,   3,3,                08:00:00, MIN
M171C0/TIME,                        01:16:00, 26:00:00

M171C0/COMMNT,     ASSUMPTION: THE ESS IS OCCUPIED THROUGHOUT THE TRIAL;
M171C0/COMMNT,             THE ESS IS ACTUALLY REQUIRED FOR EXPERIMENT
M171C0/COMMNT,             SUPPORT ONLY DURING TEST PHASES.

M171C0/RES,     ESS,               -00:00:15, 00:01:45

M171C0/COMMNT,     THE START TIME IS ARBITRARILY PLACED 15 MINUTES
M171C0/COMMNT,             BEFORE INITIATION OF THE TEST PHASES.
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PRELIMINARY EXPERIMENT DATA BASE

M171C0/RES,   EXPONE,   00:00:00, 00:01:10

M171C1/EQUIV,   M171C0

M171C1/PRI,   14

M171C1/TITLE,   TRIALS FOR THE FIRST SUBJECT

M171C1/COMMNT,   ALL MODES OF M171 FOR THE SAME SUBJECT MUST BE
M171C1/COMMNT,   SCHEDULED AT APPROXIMATELY THE SAME TIME OF DAY.

M171C1/ENABLE, BREAK,   00:04:15, 00:04:30

M171C1/COMMNT,   A LATE 'MORNING' OPPORTUNITY IS SELECTED ARBITRARILY.

M171C1/COMMNT,   TEST PHASES OF M093 MUST NOT OCCUR LESS THAN THREE
M171C1/COMMNT,   HOURS PRIOR TO TEST PHASES OF M171.

M171C1/COMMNT,   INHIBITS ARE INCLUDED UNDER M093.

M171C1/RES,   CREW A,   -00:00:15, 00:01:45
M171C1/RES,   ANY,   00:00:00, 00:01:10

M171C2/EQUIV,   M171C0

M171C2/TITLE,   TRIALS FOR THE SECOND SUBJECT

M171C2/PRI,   17

M171C2/COMMNT,   ALL MODES OF M171 FOR THE SAME SUBJECT MUST BE
M171C2/COMMNT,   SCHEDULED AT APPROXIMATELY THE SAME TIME OF DAY.

M171C2/ENABLE, BREAK,   00:04:15, 00:04:30

M171C2/COMMNT,   A LATE 'MORNING' OPPORTUNITY IS SELECTED ARBITRARILY.

M171C2/COMMNT,   TEST PHASES OF M093 MUST NOT OCCUR LESS THAN THREE
M171C2/COMMNT,   HOURS PRIOR TO TEST PHASES OF M171.

M171C2/COMMNT,   INHIBITS ARE INCLUDED UNDER M093.

M171C2/RES,   CREW B,   -00:00:15, 00:01:45
M171C2/RES,   ANY,   00:00:00, 00:01:10

M171C3/EQUIV,   M171C0

M171C3/TITLE,   TRIALS FOR THE THIRD SUBJECT

M171C3/PRI,   28

M171C3/COMMNT,   ALL MODES OF M171 FOR THE SAME SUBJECT MUST BE
M171C3/COMMNT,   SCHEDULED AT APPROXIMATELY THE SAME TIME OF DAY.

PRELIMINARY EXPERIMENT DATA BASE

M171C3/ENABLE, LUNCH,   00:04:00, 00:07:00

M171C3/COMMNT,   A LATE 'AFTERNOON' OPPORTUNITY IS SELECTED ARBITRARILY.

M171C3/COMMNT,   TEST PHASES OF M093 MUST NOT OCCUR LESS THAN THREE
M171C3/COMMNT,   HOURS PRIOR TO TEST PHASES OF M171.

M171C3/INHIB, M093T3,   00:00:00, 00:02:17

M171C3/COMMNT,   THE FOLLOWING INHIBITS ARE FROM THE TASKS NAMED.

M171C3/INHIB, M092T3,   -00:03:10, 00:00:00

M171C3/RES,   CREW C,   -00:00:15, 00:01:45
M171C3/RES,   ANY,   00:00:00, 00:01:10

M171C0/DELETE

M507   /TITLE,   GRAVITY SUBSTITUTE WORKBENCH

M507   /PRI,   120
M507   /OBJEC, 1,1
M507   /TIME,   01:16:00, 26:00:00
M507   /RES,   ANY,   00:00:00, 00:00:52

M508A0/TITILE,   EVA HARDWARE EVALUATION
M508A0/TITLE,   UNSUITED TASKS

M508A0/COMMNT,   THE CREW-TIME REQUIREMENT IS BASED ON A PREVIOUS CON-
M508A0/COMMNT,   FIGURATION OF M508 THAT USED A TASK BOARD. THE
M508A0/COMMNT,   CURRENT CREW-TIME REQUIREMENT IS UNKNOWN, BUT IT
M508A0/COMMNT,   SHOULD BE CONSIDERABLY SHORTER.

M508A0/PRI,   0
M508A0/OBJEC,   1,1
M508A0/TIME,   01:16:00, 26:00:00

M508A0/COMMNT,   THE START TIME OCCURS AT THE BEGINNING OF DATA
M508A0/COMMNT,   TAKING.

M508A0/RES,   EXPONE,   00:00:00, 00:02:15

M508A1/EQUIV, M508A0
M508A1/PRI,   123

M508A1/COMMNT,   SPECIFIC CREWMEN ARE ASSIGNED ARBITRARILY AS SUBJECT.

M508A1/RES,   CREW B,   -00:00:30, 00:02:45

M508A2/EQUIV, M508A0

M508A2/PRI,   125

PRELIMINARY EXPERIMENT DATA BASE

M508A2/COMMNT,   THE SEQUENCE SHOWN IS IMPOSED ARBITRARILY.

M508A2/ENABLE, M508B1,   00:03:45

M508A2/COMMNT,   SPECIFIC CREWMEN ARE ASSIGNED ARBITRARILY AS SUBJECT.
M508A2/RES,   CREW C,   -00:00:30, 00:02:45

M508A2/COMMNT,   ALLOCATION OF TWO TRIALS OF MODE A TO THE FIRST
M508A2/COMMNT,   MISSION IS ARBITRARY.

M508A0/DELETE

M508B0/TITLE,   EVA HARDWARE EVALUATION
M508B0/TITLE,   SUITED TASKS

M508B0/COMMNT,   THE CREW-TIME REQUIREMENT IS BASED ON A PREVIOUS CON-
M508B0/COMMNT,   FIGURATION OF M508 THAT USED A TASK BOARD.   THE
M508B0/COMMNT,   CURRENT CREW-TIME REQUIREMENT IS UNKNOWN, BUT IT
M508B0/COMMNT,   SHOULD BE CONSIDERABLY SHORTER.

M508B0/PRI,   0
M508B0/OBJEC,   1,1
M508B0/TIME,   01:16:00, 26:00:00

M508B0/COMMNT,   THE START TIME OCCURS AT THE BEGINNING OF DATA
M508B0/COMMNT,   TAKING.

M508B0/RES,   EXPONE,   00:00:00, 00:02:15

M508B1/EQUIV,   M508B0
M508B1/PRI,   124

M508B1/COMMNT,   THE SEQUENCE SHOWN IS IMPOSED ARBITRARILY.

M508B1/ENABLE, M508A1,   00:03:30

M508B1/COMMNT,   SPECIFIC CREWMEN ARE ASSIGNED ARBITRARILY AS SUBJECT.

M508B1/RES,   CREW B,   -00:00:45, 00:03:00
M508B1/RES,   ANY,   00:00:00, 00:02:25

M508B2/EQUIV,   M508B0
M508B2/PRI,   126

M508B2/COMMNT,   THE SEQUENCE SHOWN IS IMPOSED ARBITRARILY.

M508B2/ENABLE, M508A2,   00:03:30

M508B2/COMMNT,   SPECIFIC CREWMEN ARE ASSIGNED ARBITRARILY AS SUBJECT.

M508B2/RES,   CREW C,   -00:00:45, 00:03:00
M508B2/RES,   ANY,   00:00:00, 00:02:25

M508B2/COMMNT,   ALLOCATION OF TWO TRIALS OF MODE B TO THE FIRST

PRELIMINARY EXPERIMENT DATA BASE

```
M508B2/COMMNT,          MISSION IS ARBITRARY.

M508B0/DELETE


M509A /TITLE,      ASTRONAUT MANEUVERING EQUIPMENT
M509A /TITLE,          FIRST RUN

M509A /PRI,     40
M509A /OBJEC,   1,1
M509A /TIME,                    01:16:00, 26:00:00
M509A /RES,     EXPTWO,         00:00:00, 00:01:25

M509A /COMMNT,     FIRST SUBJECT - TETHERED FLIGHT FOR 20 MIN. IN SHIRT-
M509A /COMMNT,          SLEEVES
M509A /COMMNT,     FIRST SUBJECT - FREE FLIGHT FOR 1 HR. IN SHIRTSLEEVES

M509A /RES,     CREW A,      -00:00:20, 00:01:40
M509A /RES,     ANY,          00:00:00, 00:01:25

M509A /COMMNT,     ASSIGNMENT OF SPECIFIC CREWMEN AS FIRST, SECOND, AND
M509A /COMMNT,          THIRD SUBJECT IS ARBITRARY.

M509A /COMMNT,     ASSUMPTION: ONE CREWMAN PERFORMS PREPARATION AND
M509A /COMMNT,          POST-TEST PHASES -- THESE TIMES ARE ASSIGNED
M509A /COMMNT,          ARBITRARILY.


M509B /TITLE,      ASTRONAUT MANEUVERING EQUIPMENT
M509B /TITLE,          SECOND RUN

M509B /PRI,     41
M509B /OBJEC,   1,1
M509B /TIME,                    01:16:00, 26:00:00

M509B /COMMNT,     THE IMPOSED SEQUENCE AND TIMES BETWEEN TASKS MAIN-
M509B /COMMNT,          TAINS NITROGEN PARTIAL PRESSURES AT ACCEPTABLE
M509B /COMMNT,          LEVELS.

M509B /ENABLE,  M509A,          05:00:00
M509B /RES,     EXPTWO,         00:00:00, 00:01:00

M509B /COMMNT,     FIRST SUBJECT - FREE FLIGHT FOR 1 HR. IN SHIRTSLEEVES

M509B /RES,     CREW A,      -00:00:25, 00:01:15
M509B /RES,     ANY,          00:00:00, 00:01:00

M509B /COMMNT,     ASSIGNMENT OF SPECIFIC CREWMEN AS FIRST, SECOND, AND
M509B /COMMNT,          THIRD SUBJECT IS ARBITRARY.

M509B /COMMNT,     ASSUMPTION: ONE CREWMAN PERFORMS PREPARATION AND
M509B /COMMNT,          POST-TEST PHASES -- THESE TIMES ARE ASSIGNED
M509B /COMMNT,          ARBITRARILY.


M509C /TITLE,      ASTRONAUT MANEUVERING EQUIPMENT
M509C /TITLE,          THIRD RUN
```

PRELIMINARY EXPERIMENT DATA BASE


```
M509C  /PRI,      42
M509C  /OBJEC,    1,1
M509C  /TIME,                     01:16:00, 26:00:00

M509C  /COMMNT,   THE IMPOSED SEQUENCE AND TIMES BETWEEN TASKS MAIN-
M509C  /COMMNT,       TAINS NITROGEN PARTIAL PRESSURES AT ACCEPTABLE
M509C  /COMMNT,       LEVELS.

M509C  /ENABLE,   M509B,          05:00:00
M509C  /RES,      EXPTWO,         00:00:00, 00:02:05

M509C  /COMMNT,   SECOND SUBJECT - FREE FLIGHT FOR 20 MIN. IN SHIRT-
M509C  /COMMNT,       SLEEVES
M509C  /COMMNT,   FIRST SUBJECT - TETHERED FLIGHT FOR 1 HR., SUITED
M509C  /COMMNT,   SECOND SUBJECT - TETHERED FLIGHT FOR 20 MIN. IN
M509C  /COMMNT,       SHIRTSLEEVES

M509C  /RES,      CREW A,         -00:00:40, 00:02:45
M509C  /RES,      CREW B,         00:00:00, 00:02:20

M509C  /COMMNT,   ASSIGNMENT OF SPECIFIC CREWMEN AS FIRST, SECOND, AND
M509C  /COMMNT,       THIRD SUBJECT IS ARBITRARY.

M509C  /COMMNT,   ASSUMPTION: ONE CREWMAN PERFORMS PREPARATION AND
M509C  /COMMNT,       POST-TEST PHASES -- THESE TIMES ARE ASSIGNED
M509C  /COMMNT,       ARBITRARILY.


M509D  /TITLE,    ASTRONAUT MANEUVERING EQUIPMENT
M509D  /TITLE,        FOURTH RUN

M509D  /PRI,      43
M509D  /OBJEC,    1,1
M509D  /TIME,                     01:16:00, 26:00:00

M509D  /COMMNT,   THE IMPOSED SEQUENCE AND TIMES BETWEEN TASKS MAIN-
M509D  /COMMNT,       TAINS NITROGEN PARTIAL PRESSURES AT ACCEPTABLE
M509D  /COMMNT,       LEVELS.

M509D  /ENABLE,   M509C,          02:00:00
M509D  /RES,      EXPTWO,         00:00:00, 00:01:00

M509D  /COMMNT,   SECOND SUBJECT - FREE FLIGHT FOR 1 HR. IN SHIRT-
M509D  /COMMNT,       SLEEVES

M509D  /RES,      CREW B,         -00:00:25, 00:01:15
M509D  /RES,      ANY,            00:00:00, 00:01:00

M509D  /COMMNT,   ASSIGNMENT OF SPECIFIC CREWMEN AS FIRST, SECOND, AND
M509D  /COMMNT,       THIRD SUBJECT IS ARBITRARY.

M509D  /COMMNT,   ASSUMPTION: ONE CREWMAN PERFORMS PREPARATION AND
M509D  /COMMNT,       POST-TEST PHASES -- THESE TIMES ARE ASSIGNED
M509D  /COMMNT,       ARBITRARILY.

M509E  /TITLE,    ASTRONAUT MANEUVERING EQUIPMENT
```

PRELIMINARY EXPERIMENT DATA BASE

```
M509E  /TITLE,          FIFTH RUN

M509E  /PRI,      44
M509E  /OBJEC,    1,1
M509E  /TIME,                      01:16:00,  26:00:00

M509E  /COMMNT,    THE IMPOSED SEQUENCE AND TIMES BETWEEN TASKS MAIN-
M509E  /COMMNT,        TAINS NITROGEN PARTIAL PRESSURES AT ACCEPTABLE
M509E  /COMMNT,        LEVELS.

M509E  /ENABLE,  M509D,         05:00:00
M509E  /RES,     EXPTWO,        00:00:00,  00:02:05

M509E  /COMMNT,    SECOND SUBJECT - TETHERED FLIGHT FOR 1 HR., SUITED
M509E  /COMMNT,    THIRD SUBJECT - TETHERED FLIGHT FOR 20 MIN. IN
M509E  /COMMNT,        SHIRTSLEEVES
M509E  /COMMNT,    THIRD SUBJECT - FREE FLIGHT FOR 20 MIN. IN SHIRT-
M509E  /COMMNT,        SLEEVES

M509E  /RES,     CREW B,       -00:00:40,  00:02:05
M509E  /RES,     CREW C,        00:00:00,  00:02:20

M509E  /COMMNT,    ASSIGNMENT OF SPECIFIC CREWMEN AS FIRST, SECOND, AND
M509E  /COMMNT,        THIRD SUBJECT IS ARBITRARY.

M509E  /COMMNT,    ASSUMPTION: ONE CREWMAN PERFORMS PREPARATION AND
M509E  /COMMNT,        POST-TEST PHASES -- THESE TIMES ARE ASSIGNED
M509E  /COMMNT,        ARBITRARILY.


M509F  /TITLE,    ASTRONAUT MANEUVERING EQUIPMENT
M509F  /TITLE,        SIXTH RUN

M509F  /PRI,      45
M509F  /OBJEC,    1,1
M509F  /TIME,                      01:16:00,  26:00:00

M509F  /COMMNT,    THE IMPOSED SEQUENCE AND TIMES BETWEEN TASKS MAIN-
M509F  /COMMNT,        TAINS NITROGEN PARTIAL PRESSURES AT ACCEPTABLE
M509F  /COMMNT,        LEVELS.

M509F  /ENABLE,  M509E,         02:00:00
M509F  /RES,     EXPTWO,        00:00:00,  00:01:00

M509F  /COMMNT,    THIRD SUBJECT - FREE FLIGHT FOR 1 HR. IN SHIRTSLEEVES

M509F  /RES,     CREW C,       -00:00:25,  00:01:15
M509F  /RES,     ANY,           00:00:00,  00:01:00

M509F  /COMMNT,    ASSIGNMENT OF SPECIFIC CREWMEN AS FIRST, SECOND, AND
M509F  /COMMNT,        THIRD SUBJECT IS ARBITRARY.

M509F  /COMMNT,    ASSUMPTION: ONE CREWMAN PERFORMS PREPARATION AND
M509F  /COMMNT,        POST-TEST PHASES -- THESE TIMES ARE ASSIGNED
M509F  /COMMNT,        ARBITRARILY.
```

PRELIMINARY EXPERIMENT DATA BASE

```
M512A  /TITLE,      MATERIALS PROCESSING IN SPACE
M512A  /TITLE,          PREPARATION

M512A  /PRI,     111
M512A  /OBJEC,   1,1
M512A  /TIME,                    01:16:00,  26:00:00
M512A  /RES,     ANY,            00:00:00,  00:02:31


M512B  /TITLE,      MATERIALS PROCESSING IN SPACE
M512B  /TITLE,          ELECTRON BEAM WELDING

M512B  /PRI,     112
M512B  /OBJEC,   1,1
M512B  /TIME,                    01:16:00,  26:00:00

M512B  /COMMNT,    THE ASSIGNED SEQUENCE OF TASKS IS REQUIRED.

M512B  /ENABLE,  M512A,          00:02:31

M512B  /COMMNT,    ASSUMPTION: DISTRIBUTION OF CREW TIME IS AS SHOWN.

M512B  /RES,     ANY1,           00:00:00,  00:00:10
M512B  /RES,     ANY2,           00:00:40,  00:00:45


M512C  /TITLE,      MATERIALS PROCESSING IN SPACE
M512C  /TITLE,          SPHERICAL FORMING

M512C  /PRI,     113
M512C  /OBJEC,   1,1
M512C  /TIME,                    01:16:00,  26:00:00

M512C  /COMMNT,    THE ASSIGNED SEQUENCE OF TASKS IS REQUIRED.

M512C  /ENABLE,  M512B,          00:00:45
M512C  /RES,     ANY,            00:00:00,  00:00:58


M512D  /TITLE,      MATERIALS PROCESSING IN SPACE
M512D  /TITLE,          EXOTHERMIC BRAZE

M512D  /PRI,     114
M512D  /OBJEC,   1,1
M512D  /TIME,                    01:16:00,  26:00:00

M512D  /COMMNT,    THE ASSIGNED SEQUENCE OF TASKS IS REQUIRED.

M512D  /ENABLE,  M512C,          00:00:58
M512D  /RES,     ANY,            00:00:00,  00:02:28


M512E  /TITLE,      MATERIALS PROCESSING IN SPACE
M512E  /TITLE,          COMPOSITE STRUCTURE

M512E  /PRI,     115
M512E  /OBJEC,   1,1
```

PRELIMINARY EXPERIMENT DATA BASE

```
M512E  /TIME,                   01:16:00, 26:00:00

M512E  /COMMNT,    THE ASSIGNED SEQUENCE OF TASKS IS REQUIRED.

M512E  /ENABLE, M512D,          00:02:28
M512E  /RES,     ANY,           00:00:00, 00:00:33


M512F  /TITLE,     MATERIALS PROCESSING IN SPACE
M512F  /TITLE,           SINGLE CRYSTAL GROWTH

M512F  /PRI,     116
M512F  /OBJEC,   1,1
M512F  /TIME,                   01:16:00, 26:00:00

M512F  /COMMNT,    THE ASSIGNED SEQUENCE OF TASKS IS REQUIRED.

M512F  /ENABLE, M512F,          00:00:33

M512F  /COMMNT,    A PERIOD OF FOUR DAYS IS REQUIRED FOR CRYSTAL GROWTH.

M512F  /RES,     ANY1,          00:00:00, 00:00:17
M512F  /RES,     ANY2,          04:04:17, 04:04:22


M512G  /TITLE,     MATERIALS PROCESSING IN SPACE
M512G  /TITLE,           STOWAGE

M512G  /PRI,     117
M512G  /OBJEC,   1,1
M512G  /TIME,                   01:16:00, 26:00:00

M512G  /COMMNT,    THE ASSIGNED SEQUENCE OF TASKS IS REQUIRED.

M512G  /ENABLE, M512F,          00:00:17
M512G  /RES,     ANY,           00:00:00, 00:00:10


S009A  /TITLE,     NUCLEAR EMULSION
S009A  /TITLE,           DEPLOYMENT

S009A  /PRI,     118
S009A  /OBJEC,   1,1

S009A  /COMMNT,    DEPLOYMENT ON THE FIFTH MISSION DAY IS REQUIRED.

S009A  /TIME,                   05:00:00, 06:00:00
S009A  /RES,     ANY,           00:00:00, 00:00:21

S009A  /COMMNT,    AFTER DEPLOYMENT, PERIODIC REALIGNMENTS AND
S009A  /COMMNT,          ASSOCIATED UPDATES ARE REQUIRED TO KEEP THE
S009A  /COMMNT,          EARTH'S ATMOSPHERE OUT OF THE EXPERIMENT FIELD
S009A  /COMMNT,          OF VIEW; THESE TASKS ARE NOT SCHEDULED HERE.


S009B  /TITLE,     NUCLEAR EMULSION
S009B  /TITLE,           RETRACTION
```

PRELIMINARY EXPERIMENT DATA BASE

S009B /PRI,   119
S009B /OBJEC,   1,1

S009B /COMMNT,   RETRACTION OF S009 SHOULD BE SCHEDULED AS LATE AS
S009B /COMMNT,   POSSIBLE IN THE MISSION; THE TWENTY-FIFTH
S009B /COMMNT,   MISSION DAY WAS SELECTED ARBITRARILY.

S009B /TIME,   25:00:00, 26:00:00

S009B /COMMNT,   RETRACTION IS SCHEDULED ONLY IF DEPLOYMENT SCHEDULES.

S009B /ENABLE, S009A,   00:00:21
S009B /RES,   ANY,   00:00:00, 00:00:12

S015F1/TITLE,   ZERO-G SINGLE HUMAN CELLS
S015F1/TITLE,   FIX CYCLE FOR THE FIRST BIOPACK

S015F1/PRI,   107
S015F1/OBJEC,   1,1

S015F1/COMMNT,   THE FOURTH MISSION DAY IS REQUIRED.

S015F1/TIME,   04:00:00, 05:00:00

S015F1/COMMNT,   ACTUAL CREW-TIME REQUIREMENTS ARE A SERIES OF SIX-
S015F1/COMMNT,   MINUTE ACTIVITIES AT THE FOLLOWING TIMES IN HRS.
S015F1/COMMNT,   FROM START TIME T: T, T+.1, T+1.0, T+1.1, T+2.0,
S015F1/COMMNT,   T+2.2, T+2.3.

S015F1/RES,   ANY1,   00:00:00, 00:00:08
S015F1/RES,   ANY2,   00:01:00, 00:01:08
S015F1/RES,   ANY3,   00:02:00, 00:02:20

S015F1/COMMNT,   ONE MINUTE IS ALLOWED ARBITRARILY FOR TRANSLATION TO
S015F1/COMMNT,   AND FROM THE COMMAND MODULE.

S015F2/TITLE,   ZERO-G SINGLE HUMAN CELLS
S015F2/TITLE,   FIX CYCLE FOR THE SECOND BIOPACK

S015F2/PRI,   108
S015F2/OBJEC,   1,1

S015F2/COMMNT,   THE TENTH MISSION DAY IS REQUIRED.

S015F2/TIME,   10:00:00, 11:00:00

S015F2/COMMNT,   SEE S015F1 FOR ACTUAL CREW-TIME REQUIREMENTS.

S015F2/RES,   ANY1,   00:00:00, 00:00:08
S015F2/RES,   ANY2,   00:01:00, 00:01:08
S015F2/RES,   ANY3,   00:02:00, 00:02:20

S015F2/COMMNT,   ONE MINUTE IS ALLOWED ARBITRARILY FOR TRANSLATION TO
S015F2/COMMNT,   AND FROM THE COMMAND MODULE.

PRELIMINARY EXPERIMENT DATA BASE


```
S019A0/TITLE,      UV STELLAR ASTRONOMY
S019A0/TITLE,          PREPARATION

S019A0/PRI,     0
S019A0/OBJEC,   1,1
S019A0/TIME,                    01:16:00, 26:00:00


S019A1/EQUIV,   S019A0
S019A1/PRI,     46
S019A1/RES,     ANY,            00:00:00, 00:00:30

S019A1/COMMNT,     EXPERIMENT TASKS THAT REQUIRE THE ANTI-SOLAR
S019A1/COMMNT,         SCIENTIFIC AIRLOCK ARE ARBITRARILY PLACED IN THE
S019A1/COMMNT,         FOLLOWING SEQUENCE:  S019A1, S019B1, S019D1,
S019A1/COMMNT,         S019A2, S019B2, S019D2, S073A, S073B1, T027F1,
S019A1/COMMNT,         T027F2, T027F3, T027F4, S073B2, S073B3, S073B4,
S019A1/COMMNT,         S073B5, S073B6, S073C, S149A1, S149B, S019A3,
S019A1/COMMNT,         S019B3, S019D3, S019A4, S019B4, S019C, S019D4,
S019A1/COMMNT,         S149A2.


S019A2/EQUIV,   S019A0
S019A2/PRI,     49

S019A2/COMMNT,     THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S019A2/COMMNT,         ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S019A2/ENABLE,  S019D1,         00:12:00

S019A2/COMMNT,     TWELVE HOURS BETWEEN STOWAGE AND SET-UP ASSURES THAT
S019A2/COMMNT,         THE NEXT OPPORTUNITY FOR SET-UP WILL OCCUR ON A
S019A2/COMMNT,         DIFFERENT CREW DAY.

S019A2/RES,     ANY,            00:00:00, 00:00:30


S019A3/EQUIV,   S019A0
S019A3/PRI,     72

S019A3/COMMNT,     THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S019A3/COMMNT,         ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S019A3/ENABLE,  S149B2,         00:12:00

S019A3/COMMNT,     TWELVE HOURS BETWEEN STOWAGE AND SET-UP ASSURES THAT
S019A3/COMMNT,         THE NEXT OPPORTUNITY FOR SET-UP WILL OCCUR ON A
S019A3/COMMNT,         DIFFERENT CREW DAY.

S019A3/COMMNT,     TWO GROUPS OF OBSERVATIONS ARE DESIRED FOR S019 WITH
S019A3/COMMNT,         A MINIMUM OF FIVE DAYS BETWEEN THEM.

S019A3/ENABLE,  S019D2,         05:00:10
S019A3/RES,     ANY,            00:00:00, 00:00:30
```

PRELIMINARY EXPERIMENT DATA BASE

S019A4/EQUIV,   S019A0
S019A4/PRI,   75

S019A4/COMMNT,   THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S019A4/COMMNT,   ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S019A4/ENABLE,   S019L3,   00:12:00

S019A4/COMMNT,   TWELVE HOURS BETWEEN STOWAGE AND SET-UP ASSURES THAT
S019A4/COMMNT,   THE NEXT OPPORTUNITY FOR SET-UP WILL OCCUR ON A
S019A4/COMMNT,   DIFFERENT CREW DAY.

S019A4/RES,   ANY,   00:00:00, 00:00:30

S019A0/DELETE

S019B0/TITLE,   UV STELLAR ASTRONOMY
S019B0/TITLE,   EXPOSURE SEQUENCE FOR TWO STARFIELDS

S019B0/PRI,   0

S019B0/COMMNT,   THE S019 SPECTROGRAPH SHOULD NOT BE MOUNTED FOR MORE
S019B0/COMMNT,   THAN TWELVE HOURS TOTAL BETWEEN OBSERVATIONS.

S019B0/COMMNT,   ASSUMPTION: CMG MOMENTUM DUMP MANEUVERS CAN BE
S019B0/COMMNT,   SUSPENDED DURING A PERFORMANCE OF S019 OR S073,
S019B0/COMMNT,   AS LONG AS THESE TASKS ARE PERFORMED ON NON-
S019B0/COMMNT,   CONSECUTIVE ORBITS.

S019B0/COMMNT,   IT SHOULD BE POSSIBLE TO SCHEDULE SET-UP, THREE OR
S019B0/COMMNT,   FOUR NIGHT-PASS OBSERVATIONS, AND STOWAGE IN
S019B0/COMMNT,   ONE CREW DAY TO MEET THE ABOVE REQUIREMENTS.

S019B0/OBJEC,   1,3,   00:03:00, 09:00:36
S019B0/TIME,   01:16:00, 26:00:00

S019B0/COMMNT,   THIRTY-SIX MINUTES IS TAKEN AS A NOMINAL DURATION FOR
S019B0/COMMNT,   A NIGHT PASS.

S019B0/RES,   (NOT)DAY,   00:00:00, 00:00:36

S019B1/EQUIV,   S019B0
S019B1/PRI,   47

S019B1/COMMNT,   THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S019B1/COMMNT,   ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S019B1/ENABLE,   S019A1,   00:00:30, 00:06:30

S019B1/COMMNT,   THE TWELVE-HOUR MAXIMUM FOR S019 TO BE MOUNTED
S019B1/COMMNT,   BETWEEN OBSERVATIONS IS ARBITRARILY APPORTIONED
S019B1/COMMNT,   AS SIX HOURS TO STOW S019 AFTER THE LAST OBSER-
S019B1/COMMNT,   VATION ON A GIVEN DAY AND SIX HOURS AFTER THE
S019B1/COMMNT,   NEXT SET-UP UNTIL ANTOHER OBSERVATION IS MADE.

PRELIMINARY EXPERIMENT DATA BASE

S019B1/RES,   ANY,   00:00:00, 00:00:36

S019B2/EQUIV,   S019B0

S019B2/COMMNT,   SEE COMMENTS UNDER S019B1.

S019B2/PRI,   50
S019B2/ENABLE,   S019A2,   00:00:30, 00:06:30
S019B2/RES,   ANY,   00:00:00, 00:00:36

S019B3/EQUIV,   S019B0

S019B3/COMMNT,   SEE COMMENTS UNDER S019B1.

S019B3/PRI,   73
S019B3/ENABLE,   S019A3,   00:00:30, 00:06:30
S019B3/RES,   ANY,   00:00:00, 00:00:36

S019B4/EQUIV,   S019B0

S019B4/COMMNT,   SEE COMMENTS UNDER S019B1.

S019B4/PRI,   76
S019B4/ENABLE,   S019A4,   00:00:30, 00:06:30
S019B4/RES,   ANY,   00:00:00, 00:00:36

S019B0/DELETE

S019C /TITLE,   UV STELLAR ASTRONOMY
S019C /TITLE,   EXPOSURE SEQUENCE FOR ONE STARFIELD

S019C /PRI,   77
S019C /OBJEC,   1,1

S019C /COMMNT,   THE S019 SPECTROGRAPH SHOULD NOT BE MOUNTED FOR MORE
S019C /COMMNT,   THAN TWELVE HOURS TOTAL BETWEEN OBSERVATIONS.

S019C /COMMNT,   ASSUMPTION: CMG MOMENTUM DUMP MANEUVERS CAN BE
S019C /COMMNT,   SUSPENDED DURING A PERFORMANCE OF S019 OR S073,
S019C /COMMNT,   AS LONG AS THESE TASKS ARE PERFORMED ON NON-
S019C /COMMNT,   CONSECUTIVE ORBITS.

S019C /COMMNT,   THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S019C /COMMNT,   ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S019C /ENABLE,   (LAST)S019B4, 00:03:00, 00:09:36

S019C /COMMNT,   THE 25TH STARFIELD IS ARBITRARILY SCHEDULED AFTER THE
S019C /COMMNT,   LAST GROUP OF THREE NIGHT-PASS OBSERVATIONS ON
S019C /COMMNT,   THE SAME DAY.

S019C /RES,   (NOT)DAY,   00:00:00, 00:00:18

PRELIMINARY EXPERIMENT DATA BASE

```
S019C /RES,        ANY,                00:00:00, 00:00:18


S019D0/TITLE,      UV STELLAR ASTRONOMY
S019D0/TITLE,          STOWAGE

S019D0/PRI,        0
S019D0/OBJEC,      1,1
S019D0/TIME,                           01:16:00, 26:00:00


S019D1/EQUIV,      S019D0
S019D1/PRI,        48

S019D1/COMMNT,     THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S019D1/COMMNT,         ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S019D1/ENABLE,     (LAST)S019B1, 00:00:36, 00:06:36

S019D1/COMMNT,     THE TWELVE-HOUR MAXIMUM FOR S019 TO BE MOUNTED
S019D1/COMMNT,         BETWEEN OBSERVATIONS IS ARBITRARILY APPORTIONED
S019D1/COMMNT,         AS SIX HOURS TO STOW S019 AFTER THE LAST OBSER-
S019D1/COMMNT,         VATION ON A GIVEN DAY AND SIX HOURS AFTER THE
S019D1/COMMNT,         NEXT SET-UP UNTIL ANTOHER OBSERVATION IS MADE.

S019D1/RES,        ANY,                00:00:00, 00:00:10


S019D2/EQUIV,      S019D0

S019D2/COMMNT,     SEE COMMENTS UNDER S019D1.

S019D2/PRI,        51
S019D2/ENABLE,     (LAST)S019B2, 00:00:36, 00:06:36
S019D2/RES,        ANY,                00:00:00, 00:00:10


S019D3/EQUIV,      S019D0

S019D3/COMMNT,     SEE COMMENTS UNDER S019D1.

S019D3/PRI,        74
S019D3/ENABLE,     (LAST)S019B3, 00:00:36, 00:06:36
S019D3/RES,        ANY,                00:00:00, 00:00:10


S019D4/EQUIV,      S019D0

S019D4/COMMNT,     SEE COMMENTS UNDER S019D1.

S019D4/PRI,        78
S019D4/ENABLE,     S019C,              00:00:18, 00:06:18
S019D4/RES,        ANY,                00:00:00, 00:00:10

S019D0/DELETE
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PRELIMINARY EXPERIMENT DATA BASE

```
S020A0/TITLE,      UV/X-RAY SOLAR PHOTOGRAPHY
S020A0/TITLE,           PREPARATION

S020A0/PRI,     0
S020A0/OBJEC,   1,1
S020A0/TIME,                      01:16:00, 26:00:00


S020A1/EQUIV,   S020A0
S020A1/PRI,     79

S020A1/COMMNT,     EXPERIMENT TASKS THAT REQUIRE THE SOLAR SCIENTIFIC
S020A1/COMMNT,          AIRLOCK ARE ARBITRARILY PLACED IN THE FOLLOWING
S020A1/COMMNT,          SEQUENCE: T027C, T027D1, T027D2, T027D3, T027D4,
S020A1/COMMNT,          T027E, S020A1, S020B, S020C1, S020C2, S020D1,
S020A1/COMMNT,          S020E1, S020F1, S020G1, S020H1, T027A, T027B,
S020A1/COMMNT,          T025A, T025B, T025C1, T025C2, T025C3, T025C4,
S020A1/COMMNT,          T025C5, T025D, S020A2, S020C3, S020C4, S020D2,
S020A1/COMMNT,          S020E2, S020F2, S020G2, S020H2.

S020A1/ENABLE,  T027E,          00:00:31
S020A1/RES,     ANY,            00:00:00, 00:00:35


S020A2/EQUIV,   S020A0
S020A2/PRI,     98

S020A2/COMMNT,     THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
S020A2/COMMNT,          SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

S020A2/ENABLE,  T025D,          03:00:26

S020A2/COMMNT,     EIGHT DAYS ARE SCHEDULED ARBITRARILY BETWEEN T025D
S020A2/COMMNT,          AND S020A2 TO PUT THE SECOND SET OF OBSERVATIONS
S020A2/COMMNT,          FOR S020 AS LATE IN THE MISSION AS POSSIBLE.

S020A2/RES,     ANY,            00:00:00, 00:00:35

S020A0/DELETE


S020B /TITLE,      UV/X-RAY SOLAR PHOTOGRAPHY
S020B /TITLE,           BIAS CHECK

S020B /PRI,     80

S020B /COMMNT,     ASSUMPTION: THE BIAS CHECK IS GOOD FOR 28 DAYS.

S020B /OBJEC,   1,1
S020B /TIME,                      01:16:00, 26:00:00

S020B /COMMNT,     THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
S020B /COMMNT,          SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

S020B /ENABLE,  S020A1,         00:00:35

S020B /COMMNT,     A BIAS CHECK MUST FOLLOW THE FIRST SET-UP.
```

PRELIMINARY EXPERIMENT DATA BASE


```
S020B /RES,      DAY,            00:00:00,  00:00:30
S020B /RES,      ANY1,           00:00:00,  00:00:30
S020B /RES,      ANY2,           00:00:00,  00:00:30


S020C0/TITLE,        UV/X-RAY SOLAR PHOTOGRAPHY
S020C0/TITLE,            HALF OF SIXTY-MINUTE EXPOSURE

S020C0/PRI,      0
S020C0/OBJEC,    1,1
S020C0/TIME,                     01:16:00,  26:00:00

S020C0/COMMNT,   EXPOSURE MUST BE MADE BETWEEN FIVE MINUTES AFTER
S020C0/COMMNT,           SUNRISE AND FIVE MINUTES BEFORE SUNSET.

S020C0/RES,      DAY,           -00:00:05,  00:00:35

S020C0/COMMNT,   THE START TIME IS PLACED AT THE BEGINNING OF THE
S020C0/COMMNT,           EXPOSURE.


S020C1/EQUIV,    S020C0
S020C1/PRI,      81

S020C1/COMMNT,   THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
S020C1/COMMNT,           SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

S020C1/ENABLE,   S020B,          00:00:33
S020C1/RES,      ANY,           -00:00:03,  00:00:32

S020C1/COMMNT,   ASSUMPTION: THREE MINUTES ARE ALLOWED ARBITRARILY TO
S020C1/COMMNT,           PREPARE FOR AN EXPOSURE AND TWO MINUTES ARE
S020C1/COMMNT,           ALLOWED AFTER THE EXPOSURE.


S020C2/EQUIV,    S020C0

S020C2/COMMNT,   SEE COMMENTS UNDER S020C1.

S020C2/PRI,      82
S020C2/ENABLE,   S020C1,         00:00:35
S020C2/RES,      ANY,           -00:00:03,  00:00:32


S020C3/EQUIV,    S020C0

S020C3/COMMNT,   SEE COMMENTS UNDER S020C1.

S020C3/PRI,      99
S020C3/ENABLE,   S020A2,         00:00:35
S020C3/RES,      ANY,           -00:00:03,  00:00:32


S020C4/EQUIV,    S020C0

S020C4/COMMNT,   SEE COMMENTS UNDER S020C1.
```

PRELIMINARY EXPERIMENT DATA BASE

S020C4/PRI,   100
S020C4/ENABLE,   S020C3,   00:00:35
S020C4/RES,   ANY,   -00:00:03, 00:00:32

S020C0/DELETE

S020D0/TITLE,   UV/X-RAY SOLAR PHOTOGRAPHY
S020D0/TITLE,   THIRTY-MINUTE EXPOSURE

S020D0/COMMNT,   SEE COMMENTS UNDER S020C0.

S020D0/PRI,   0
S020D0/OBJEC,   1,1
S020D0/TIME,   01:16:00, 26:00:00
S020D0/RES,   DAY,   -00:00:05, 00:00:35

S020D1/EQUIV,   S020D0

S020D1/COMMNT,   SEE COMMENTS UNDER S020C1.

S020D1/PRI,   83
S020D1/ENABLE,   S020C2,   00:00:35
S020D1/RES,   ANY,   -00:00:03, 00:00:32

S020D2/EQUIV,   S020D0

S020D2/COMMNT,   SEE COMMENTS UNDER S020C1.

S020D2/PRI,   101
S020D2/ENABLE,   S020C4,   00:00:35
S020D2/RES,   ANY,   -00:00:03, 00:00:32

S020D0/DELETE

S020E0/TITLE,   UV/X-RAY SOLAR PHOTOGRAPHY
S020E0/TITLE,   FIFTEEN-MINUTE EXPOSURE

S020E0/COMMNT,   SEE COMMENTS UNDER S020C0.

S020E0/PRI,   0
S020E0/OBJEC,   1,1
S020E0/TIME,   01:16:00, 26:00:00
S020E0/RES,   DAY,   -00:00:05, 00:00:20

S020E1/EQUIV,   S020E0

S020E1/COMMNT,   SEE COMMENTS UNDER S020C1.

S020E1/PRI,   84
S020E1/ENABLE,   S020D1,   00:00:35
S020E1/RES,   ANY,   -00:00:03, 00:00:17

PRELIMINARY EXPERIMENT DATA BASE

S020E2/EQUIV,   S020E0

S020E2/COMMNT,   SEE COMMENTS UNDER S020C1.

S020E2/PRI,   102
S020E2/ENABLE, S020D2,   00:00:35
S020E2/RES,   ANY,   -00:00:03, 00:00:17

S020E0/DELETE

S020F0/TITLE,   UV/X-RAY SOLAR PHOTOGRAPHY
S020F0/TITLE,   EIGHT-MINUTE EXPOSURE

S020F0/COMMNT,   SEE COMMENTS UNDER S020C0.

S020F0/PRI,   0
S020F0/OBJEC,   1,1
S020F0/TIME,   01:16:00, 26:00:00
S020F0/RES,   DAY,   -00:00:05, 00:00:13

S020F1/EQUIV,   S020F0

S020F1/COMMNT,   SEE COMMENTS UNDER S020C1.

S020F1/PRI,   85
S020F1/ENABLE, S020E1,   00:00:20
S020F1/RES,   ANY,   -00:00:03, 00:00:10

S020F2/EQUIV,   S020F0

S020F2/COMMNT,   SEE COMMENTS UNDER S020C1.

S020F2/PRI,   103
S020F2/ENABLE, S020E2,   00:00:20
S020F2/RES,   ANY,   -00:00:03, 00:00:10

S020F0/DELETE

S020G0/TITLE,   UV/X-RAY SOLAR PHOTOGRAPHY
S020G0/TITLE,   FIVE-MINUTE EXPOSURE

S020G0/COMMNT,   SEE COMMENTS UNDER S020C0.

S020G0/PRI,   0
S020G0/OBJEC,   1,1
S020G0/TIME,   01:16:00, 26:00:00
S020G0/RES,   DAY,   -00:00:05, 00:00:10

S020G1/EQUIV,   S020G0

PRELIMINARY EXPERIMENT DATA BASE

S020G1/COMMNT,   SEE COMMENTS UNDER S020C1.

S020G1/PRI,   86
S020G1/ENABLE,   S020F1,   00:00:13
S020G1/RES,   ANY,   -00:00:03, 00:00:07

S020G2/EQUIV,   S020G0

S020G2/COMMNT,   SEE COMMENTS UNDER S020C1.

S020G2/PRI,   104
S020G2/ENABLE,   S020F2,   00:00:13
S020G2/RES,   ANY,   -00:00:03, 00:00:07

S020G0/DELETE

S020H0/TITLE,   UV/X-RAY SOLAR PHOTOGRAPHY
S020H0/TITLE,   STOWAGE

S020H0/PRI,   0
S020H0/OBJEC,   1,1
S020H0/TIME,   01:16:00, 26:00:00

S020H1/EQUIV,   S020H0
S020H1/PRI,   87

S020H1/COMMNT,   THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
S020H1/COMMNT,   SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

S020H1/ENABLE,   S020G1,   00:00:07
S020H1/RES,   ANY,   00:00:00, 00:00:90

S020H2/EQUIV,   S020H0

S020H2/COMMNT,   SEE COMMENTS UNDER S020H1.

S020H2/PRI,   105
S020H2/ENABLE,   S020G2,   00:00:07
S020H2/RES,   ANY,   00:00:00, 00:00:90

S020H0/DELETE

S073A /TITLE,   GEGENSCHEIN/ZODIACAL LIGHT
S073A /TITLE,   PREPARATION

S073A /PRI,   58
S073A /OBJEC,   1,1
S073A /TIME,   01:16:00, 26:00:00

S073A /COMMNT,   THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S073A /COMMNT,   ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

PRELIMINARY EXPERIMENT DATA BASE

S073A /ENABLE, S019C2,   00:00:10

S073A /COMMNT,   S073 USES THE T027 PHOTOMETER SYSTEM IN THE ANTI-
S073A /COMMNT,   SOLAR SCIENTIFIC AIRLOCK; THIS REQUIREMENT IS
S073A /COMMNT,   MET BY BEGINNING S073 AFTER OPERATION OF THE
S073A /COMMNT,   T027 PHOTOMETER IN THE SOLAR-ORIENTED SCIENTIFIC
S073A /COMMNT,   AIRLOCK HAS BEEN COMPLETED.

S073A /ENABLE, T027E,   00:00:31
S073A /RES,   ANY,   00:00:00, 00:00:45

S073B0/TITLE,   GEGENSCHEIN/ZODIACAL LIGHT
S073B0/TITLE,   EXPOSURE SEQUENCE

S073B0/PRI,   0
S073B0/OBJEC, 1,1
S073B0/TIME,   01:16:00, 26:00:00

S073B0/COMMNT,   START TIME OCCURS AT SUNSET.

S073B0/RES,   DAY,   -00:00:10, 00:00:00
S073B0/RES,   (NOT)DAY,   00:00:00, 00:00:36

S073B0/COMMNT,   ASSUMPTION: FORTY-FIVE MINUTE SCAN BEGINS THREE
S073B0/COMMNT,   MINUTES PRIOR TO SUNSET; TEN MINUTES IS ALLOWED
S073B0/COMMNT,   PRIOR TO THE SCAN FOR DEPLOYMENT OF THE
S073B0/COMMNT,   PHOTOMETERS AND TEN MINUTES IS ALLOWED AFTER THE
S073B0/COMMNT,   SCAN FOR RETRACTION.

S073B0/RES,   EXPONE,   -00:00:03, 00:00:42
S073B0/RES,   EXPTWO,   -00:00:03, 00:00:42

S073B0/COMMNT,   S073 SHOULD BE PERFORMED WITHIN PLUS OR MINUS ONE
S073B0/COMMNT,   WEEK OF NEW MOON. NO PROVISION IS MADE FOR
S073B0/COMMNT,   THIS REQUIREMENT IN THE PRESENT TASK DESCRIPTIONS.

S073B1/EQUIV, S073B0
S073B1/PRI,   59

S073B1/COMMNT,   THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S073B1/COMMNT,   ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S073B1/ENABLE, S073A,   00:00:58
S073B1/RES,   ANY,   -00:00:13, 00:00:52

S073B2/EQUIV, S073B0
S073B2/PRI,   64

S073B2/COMMNT,   THE SECOND TRIAL OF S072 SHOULD BE DELAYED UNTIL THE
S073B2/COMMNT,   PRINCIPAL INVESTIGATOR HAS COMPLETED HIS
S073B2/COMMNT,   ANALYSIS OF THE FIRST TRIAL; IT IS ASSUMED THAT
S073B2/COMMNT,   THE TIME REQUIRED TO COMPLETE FOUR TRIALS OF
S073B2/COMMNT,   T027 IN THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS
S073B2/COMMNT,   SUFFICIENT FOR THIS PURPOSE.

PRELIMINARY EXPERIMENT DATA BASE

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S073B2/COMMNT,     THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S073B2/COMMNT,          ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S073B2/ENABLE,  T027F4,          00:00:50

S073B2/COMMNT,     ASSUMPTION: CMG MOMENTUM DUMP MANEUVERS CAN BE
S073B2/COMMNT,          SUSPENDED DURING A PERFORMANCE OF S019 OR S073,
S073B2/COMMNT,          AS LONG AS THESE TASKS ARE PERFORMED ON NON-
S073B2/COMMNT,          CONSECUTIVE ORBITS.

S073B2/RES,     ANY,          -00:00:13, 00:00:52


S073B3/EQUIV,   S073E0
S073B3/PRI,     65

S073B3/COMMNT,     THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S073B3/COMMNT,          ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S073B3/ENABLE,  S073E2,          00:03:00

S073B3/COMMNT,     ASSUMPTION: CMG MOMENTUM DUMP MANEUVERS CAN BE
S073B3/COMMNT,          SUSPENDED DURING A PERFORMANCE OF S019 OR S073,
S073B3/COMMNT,          AS LONG AS THESE TASKS ARE PERFORMED ON NON-
S073B3/COMMNT,          CONSECUTIVE ORBITS.

S073B3/RES,     ANY,          -00:00:13, 00:00:52


S073B4/EQUIV,   S073E0

S073B4/COMMNT,     SEE COMMENTS UNDER S073B3.

S073B4/PRI,     66
S073B4/ENABLE,  S073E3,          00:03:00
S073B4/RES,     ANY,          -00:00:13, 00:00:52


S073B5/EQUIV,   S073E0

S073B5/COMMNT,     SEE COMMENTS UNDER S073B3.

S073B5/PRI,     67
S073B5/ENABLE,  S073E4,          00:03:00
S073B5/RES,     ANY,          -00:00:13, 00:00:52


S073B6/EQUIV,   S073E0

S073B6/COMMNT,     SEE COMMENTS UNDER S073B3.

S073B6/PRI,     68
S073B6/ENABLE,  S073F5,          00:03:00
S073B6/RES,     ANY,          -00:00:13, 00:00:52

S073B0/DELETE
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PRELIMINARY EXPERIMENT DATA BASE

S073C /TITLE,   GEGENSCHEIN/ZODIACAL LIGHT
S073C /TITLE,   STOWAGE

S073C /PRI,   69
S073C /OBJEC, 1,1
S073C /TIME,   01:16:00, 26:00:00

S073C /COMMNT,   THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
S073C /COMMNT,   ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S073C /ENABLE, S073B6,   00:00:52
S073C /RES,   ANY,   00:00:00, 00:00:45

S149A0/TITLE,   PARTICLE COLLECTION
S149A0/TITLE,   PREPARATION

S149A0/PRI,   0
S149A0/OBJEC, 1,1

S149A1/EQUIV, S149A0
S149A1/PRI,   70
S149A1/TIME,   01:16:00, 26:00:00

S149A1/COMMNT,   THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS PREFERRED; AN
S149A1/COMMNT,   ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S149A1/ENABLE, S073C,   00:00:45
S149A1/RES,   ANY,   00:00:00, 00:00:45

S149A2/EQUIV, S149A0
S149A2/PRI,   106

S149A2/COMMNT,   THE PARTICLE-COLLECTION PACKAGE IS MOUNTED AT THE END
S149A2/COMMNT,   OF THE TWENTY-EIGHT DAY MISSION FOR EXPOSURE
S149A2/COMMNT,   BETWEEN MISSIONS; THIS TASK MUST OCCUR LAST IN
S149A2/COMMNT,   THE SEQUENCE FOR THE ANTI-SOLAR SCIENTIFIC
S149A2/COMMNT,   AIRLOCK.

S149A2/COMMNT,   THE TIME REQUIREMENT IS ARBITRARY, DESIGNED TO PLACE
S149A2/COMMNT,   S149A2 NEAR THE END OF THE MISSION.

S149A2/TIME,   24:00:00, 27:00:00

S149A2/COMMNT,   THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS PREFERRED; AN
S149A2/COMMNT,   ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S149A2/ENABLE, S019D4,   00:00:10
S149A2/RES,   ANY,   00:00:00, 00:00:45

S149A0/DELETE

PRELIMINARY EXPERIMENT DATA BASE

```
S149B /TITLE,      PARTICLE COLLECTION
S149B /TITLE,          STOWAGE

S149B /PRI,     71
S149B /OBJEC,   1,1
S149B /TIME,                        01:16:00, 26:00:00

S149B /COMMNT,    AN EXPOSURE TIME OF 72 HOURS IS DESIRED DURING THE
S149B /COMMNT,        MISSION; THE MINIMUM REQUIRED TIME IS EIGHT
S149B /COMMNT,        HOURS DURING THE MISSION.

S149B /COMMNT,    THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS PREFERRED; AN
S149B /COMMNT,        ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

S149B /ENABLE,  S149A1,         03:00:45
S149B /RES,     ANY,            00:00:00, 00:00:25


T003E1/TITLE,      IN-FLIGHT AEROSOL ANALYSIS
T003E1/TITLE,          HAND-HELD MEASUREMENTS IN CM, AM/OWS HATCH, & CQ

T003E1/PRI,     7
T003E1/OBJEC,   1,1

T003E1/COMMNT,    THE FOURTH MISSION DAY IS REQUIRED.

T003E1/TIME,                        04:00:00, 05:00:00

T003E1/COMMNT,    THIS TASK MUST IMMEDIATELY FOLLOW THE STANDARD T003
T003E1/COMMNT,        MEASUREMENT IN THE CREW QUARTERS THAT IS ASSUMED
T003E1/COMMNT,        TO OCCUR AT THE END OF EACH MEAL PERIOD.

T003E1/ENABLE,  BREAK,          00:01:30, 00:01:30

T003E1/COMMNT,    THE OPPORTUNITY FOLLOWING BREAKFAST WAS SELECTED
T003E1/COMMNT,        ARBITRARILY.

T003E1/RES,     ANY,            00:00:00, 00:00:15


T003E2/TITLE,      IN-FLIGHT AEROSOL ANALYSIS
T003E2/TITLE,          HAND-HELD MEASUREMENTS IN CM, AM/OWS HATCH, & CQ

T003E2/PRI,     8
T003E2/OBJEC,   1,1

T003E2/COMMNT,    THE FOURTEENTH MISSION DAY IS REQUIRED.

T003E2/TIME,                        14:00:00, 15:00:00

T003E2/COMMNT,    THIS TASK MUST IMMEDIATELY FOLLOW THE STANDARD T003
T003E2/COMMNT,        MEASUREMENT IN THE CREW QUARTERS THAT IS ASSUMED
T003E2/COMMNT,        TO OCCUR AT THE END OF EACH MEAL PERIOD.

T003E2/ENABLE,  BREAK,          00:01:30, 00:01:30

T003E2/COMMNT,    THE OPPORTUNITY FOLLOWING BREAKFAST WAS SELECTED
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PRELIMINARY EXPERIMENT DATA BASE

```
T003E2/COMMNT,              ARBITRARILY.

T003E2/RES,      ANY,            00:00:00, 00:00:15


T003E3/TITLE,       IN-FLIGHT AEROSOL ANALYSIS
T003E3/TITLE,           HAND-HELD MEASUREMENTS IN CM, AM/OWS HATCH, & CQ

T003E3/PRI,      9
T003E3/OBJEC,    1,1

T003E3/COMMNT,      THE TWENTY-FOURTH MISSION DAY IS REQUIRED.
T003E3/TIME,                 24:00:00, 25:00:00

T003E3/COMMNT,      THIS TASK MUST IMMEDIATELY FOLLOW THE STANDARD T003
T003E3/COMMNT,          MEASUREMENT IN THE CREW QUARTERS THAT IS ASSUMED
T003E3/COMMNT,          TO OCCUR AT THE END OF EACH MEAL PERIOD.

T003E3/ENABLE, BREAK,           00:01:30, 00:01:30

T003E3/COMMNT,      THE OPPORTUNITY FOLLOWING BREAKFAST WAS SELECTED
T003E3/COMMNT,          ARBITRARILY.

T003E3/RES,      ANY,            00:00:00, 00:00:15


T013A /TITLE,       CREW VEHICLE DISTURBANCE
T013A /TITLE,           MDA SEQUENCE

T013A /PRI,      38
T013A /OBJEC,    1,1

T013A /COMMNT,      THE TIME REQUIREMENT IS INTENDED TO SCHEDULE T013A
T013A /COMMNT,          NEAR T013B;  T013B WILL NOT SCHEDULE UNTIL THE
T013A /COMMNT,          SEVENTH OR EIGHTH MISSION DAY WITH THE PLANNED
T013A /COMMNT,          SCHEDULING OF MEDICAL EXPERIMENTS.

T013A /TIME,                 07:16:00, 26:00:00

T013A /COMMNT,      START TIME OCCURS AT THE BEGINNING OF DATA-TAKING

T013A /RES,      ANY1,          -00:00:03, 00:00:13
T013A /RES,      ANY2,          -00:00:03, 00:00:13
T013A /RES,      ANY3,           00:00:00, 00:00:05


T013B /TITLE,       CREW VEHICLE DISTURBANCE
T013B /TITLE,           OWS SEQUENCE

T013B /PRI,      39
T013B /OBJEC,    1,1
T013B /TIME,                 01:16:00, 26:00:00
T013B /ENABLE, T013A,           00:00:13

T013B /COMMNT,      START TIME OCCURS AT THE BEGINNING OF DATA-TAKING

T013B /RES,      ANY1,          -00:00:13, 00:00:47
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PRELIMINARY EXPERIMENT DATA BASE

```
T013B /RES,      ANY2,           -00:00:13, 00:00:47
T013B /RES,      ANY3,            00:00:00, 00:00:30


T025A /TITLE,        CORONAGRAPH CONTAMINATION MEASUREMENT
T025A /TITLE,            PREPARATION

T025A /PRI,      90
T025A /OBJEC,    1,1
T025A /TIME,                     01:16:00, 26:00:00

T025A /COMMNT,      THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
T025A /COMMNT,          SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

T025A /ENABLE,   T027B,          00:00:40
T025A /RES,      ANY,            00:00:00, 00:00:26


T025B /TITLE,        CORONAGRAPH CONTAMINATION MEASUREMENT
T025B /TITLE,            BIAS CHECK

T025B /PRI,      91

T025B /COMMNT,      ASSUMPTION: THE BIAS CHECK IS GOOD FOR 28 DAYS.

T025B /OBJEC,    1,1
T025B /TIME,                     01:16:00, 26:00:00

T025B /COMMNT,      THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
T025B /COMMNT,          SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

T025B /ENABLE,   T025A,          00:00:26

T025B /COMMNT,      A BIAS CHECK MUST FOLLOW THE FIRST SET-UP.

T025B /RES,      DAY,            00:00:00, 00:00:30
T025B /RES,      ANY1,           00:00:00, 00:00:30
T025B /RES,      ANY2,           00:00:00, 00:00:30


T025C0/TITLE,        CORONAGRAPH CONTAMINATION MEASUREMENT
T025C0/TITLE,            OPERATION

T025C0/PRI,      0
T025C0/OBJEC,    1,1
T025C0/TIME,                     01:16:00, 26:00:00

T025C0/COMMNT,      THE SUN MUST HAVE A MINIMUM ELEVATION OF FIVE DEGREES
T025C0/COMMNT,          DURING AN EXPOSURE; THE TWO MINUTES ALLOWED
T025C0/COMMNT,          AFTER SUNRISE AND BEFORE SUNSET MORE THAN MEETS
T025C0/COMMNT,          THIS REQUIREMENT.

T025C0/RES,      DAY,            -00:00:02, 00:00:52

T025C0/COMMNT.      THE START TIME OCCURS AT THE BEGINNING OF DATA TAKING.
```

PRELIMINARY EXPERIMENT DATA BASE

```
T025C1/EQUIV,    T025C0
T025C1/PRI,      92

T025C1/COMMNT,      THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
T025C1/COMMNT,          SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

T025C1/ENABLE,   T025B,           00:00:30
T025C1/RES,      ANY,             00:00:00, 00:00:50


T025C2/EQUIV,    T025C0
T025C2/PRI,      93

T025C2/COMMNT,      EXPOSURES ON NON-CONSECUTIVE ORBITS ARE REQUIRED; A
T025C2/COMMNT,          MINIMUM TIME OF THREE HOURS BETWEEN START TIMES
T025C2/COMMNT,          IS SUFFICIENT TO MEET THIS REQUIREMENT.

T025C2/COMMNT,      THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
T025C2/COMMNT,          SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

T025C2/ENABLE,   T025C1,          00:03:00
T025C2/RES,      ANY,             00:00:00, 00:00:50


T025C3/EQUIV,    T025C0

T025C3/COMMNT,      SEE COMMENTS UNDER T025C2.

T025C3/PRI,      94
T025C3/ENABLE,   T025C2,          00:03:00
T025C3/RES,      ANY,             00:00:00, 00:00:50


T025C4/EQUIV,    T025C0

T025C4/COMMNT,      SEE COMMENTS UNDER T025C2.

T025C4/PRI,      95
T025C4/ENABLE,   T025C3,          00:03:00
T025C4/RES,      ANY,             00:00:00, 00:00:50


T025C5/EQUIV,    T025C0

T025C5/COMMNT,      SEE COMMENTS UNDER T025C2.

T025C5/PRI,      96
T025C5/ENABLE,   T025C4,          00:03:00
T025C5/RES,      ANY,             00:00:00, 00:00:50

T025C0/DELETE


T025D /TITLE,       CORONAGRAPH CONTAMINATION MEASUREMENT
T025D /TITLE,           STOWAGE

T025D /PRI,      97
```

PRELIMINARY EXPERIMENT DATA BASE

```
T025D  /OBJEC,   1,1
T025D  /TIME,                    01:16:00, 26:00:00

T025D  /COMMNT,     THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
T025D  /COMMNT,        SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

T025D  /ENABLE,  T025C5,        00:00:50
T025D  /RES,     ANY,           00:00:00, 00:00:26


T027A  /TITLE,      ATM CONTAMINATION MEASUREMENT
T027A  /TITLE,         PREPARATION OF SAMPLE ARRAY SYSTEM

T027A  /PRI,     88
T027A  /OBJEC,   1,1
T027A  /TIME,                    01:16:00, 26:00:00

T027A  /COMMNT,     THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
T027A  /COMMNT,        SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

T027A  /ENABLE,  S020H1,        00:00:90
T027A  /RES,     ANY,           00:00:00, 00:00:20


T027B  /TITLE,      ATM CONTAMINATION MEASUREMENT
T027B  /TITLE,         STOWAGE OF SAMPLE ARRAY SYSTEM

T027B  /PRI,     89
T027B  /OBJEC,   1,1
T027B  /TIME,                    01:16:00, 26:00:00

T027B  /COMMNT,     THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
T027B  /COMMNT,        SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

T027B  /ENABLE,  T027A,         05:00:20

T027B  /COMMNT,     AN EXPOSURE TIME OF FIVE DAYS IS REQUIRED FOR THE
T027B  /COMMNT,        SAMPLE ARRAY.

T027B  /RES,     ANY,           00:00:00, 00:00:40


T027C  /TITLE,      ATM CONTAMINATION MEASUREMENT
T027C  /TITLE,         PREPARATION OF PHOTOMETER SYSTEM

T027C  /PRI,     52
T027C  /OBJEC,   1,1
T027C  /TIME,                    01:16:00, 26:00:00

T027C  /COMMNT,     THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
T027C  /COMMNT,        SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

T027C  /COMMNT,     T027C BEGINS THE SEQUENCE FOR THE SOLAR SCIENTIFIC
T027C  /COMMNT,        AIRLOCK.

T027C  /RES,     ANY,           00:00:00, 00:00:48
```

PRELIMINARY EXPERIMENT DATA BASE

```
T027D0/TITLE,      ATM CONTAMINATION MEASUREMENT
T027D0/TITLE,          PHOTOMETER OPERATION

T027D0/PRI,     0
T027D0/OBJEC,   1,1
T027D0/TIME,                    01:16:00,  26:00:00
T027D0/RES,     DAY,            00:00:00,  00:00:50
T027D0/RES,     EXPONE,         00:00:00,  00:00:50
T027D0/RES,     EXPTWO,         00:00:00,  00:00:50


T027D1/EQUIV,   T027D0
T027D1/PRI,     53

T027D1/COMMNT,     THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
T027D1/COMMNT,         SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

T027D1/ENABLE,  T027C,          00:00:48

T027D1/COMMNT,     A SCAN TIME OF FIFTY MINUTES IS ASSUMED; TEN MINUTES
T027D1/COMMNT,         IS ALLOWED PRIOR TO THE SCAN FOR DEPLOYMENT OF
T027D1/COMMNT,         THE PHOTOMETERS AND TEN MINUTES IS ALLOWED AFTER
T027D1/COMMNT,         THE SCAN FOR RETRACTION.

T027D1/RES,     ANY,            -00:00:10,  00:01:00


T027D2/EQUIV,   T027D0

T027D2/COMMNT,     SEE COMMENTS UNDER T027D1.

T027D2/PRI,     54
T027D2/ENABLE,  T027D1,         00:00:50
T027D2/RES,     ANY,            -00:00:10,  00:01:00


T027D3/EQUIV,   T027D0

T027D3/COMMNT,     SEE COMMENTS UNDER T027D1.

T027D3/PRI,     55
T027D3/ENABLE,  T027D2,         00:00:50
T027D3/RES,     ANY,            -00:00:10,  00:01:00


T027D4/EQUIV,   T027D0

T027D4/COMMNT,     SEE COMMENTS UNDER T027D1.

T027D4/PRI,     56
T027D4/ENABLE,  T027D3,         00:00:50
T027D4/RES,     ANY,            -00:00:10,  00:01:00


T027E /TITLE,      ATM CONTAMINATION MEASUREMENT
T027E /TITLE,          STOWAGE OF PHOTOMETER SYSTEM
```

PRELIMINARY EXPERIMENT DATA BASE


```
T027E /PRI,      57
T027E /OBJEC,    1,1
T027E /TIME,                     01:16:00, 26:00:00

T027E /COMMNT,     THE SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN ASSUMED
T027E /COMMNT,         SEQUENCE OF TASKS IS GIVEN UNDER S020A1.

T027E /ENABLE, T027C4,          00:00:50
T027E /RES,    ANY,             00:00:00, 00:00:31


T027F0/EQUIV,  T027D0

T027F0/TITLE,      ATM CONTAMINATION MEASUREMENT
T027F0/TITLE,          PHOTOMETER OPERATION

T027F0/COMMNT,     ASSUMPTION: PREPARATION FOR T027F IS DONE BY S073A,
T027F0/COMMNT,         AND STOWAGE IS DONE BY S073C.


T027F1/EQUIV,  T027F0
T027F1/PRI,    60

T027F1/COMMNT,     THE ANTI-SOLAR SCIENTIFIC AIRLOCK IS REQUIRED; AN
T027F1/COMMNT,         ASSUMED SEQUENCE OF TASKS IS GIVEN UNDER S019A1.

T027F1/ENABLE, S073R1,          00:00:52

T027F1/COMMNT,     A SCAN TIME OF FIFTY MINUTES IS ASSUMED; TEN MINUTES
T027F1/COMMNT,         IS ALLOWED PRIOR TO THE SCAN FOR DEPLOYMENT OF
T027F1/COMMNT,         THE PHOTOMETERS AND TEN MINUTES IS ALLOWED AFTER
T027F1/COMMNT,         THE SCAN FOR RETRACTION.

T027F1/RES,    ANY,             -00:00:10, 00:01:00


T027F2/EQUIV,  T027F0

T027F2/COMMNT,     SEE COMMENTS UNDER T027F1.

T027F2/PRI,    61
T027F2/ENABLE, T027F1,          00:00:50
T027F2/RES,    ANY,             -00:00:10, 00:01:00


T027F3/EQUIV,  T027F0

T027F3/COMMNT,     SEE COMMENTS UNDER T027F1.

T027F3/PRI,    62
T027F3/ENABLE, T027F2,          00:00:50
T027F3/RES,    ANY,             -00:00:10, 00:01:00


T027F4/EQUIV,  T027F0
```

PRELIMINARY EXPERIMENT DATA BASE

T027F4/COMMNT,   SEE COMMENTS UNDER T027F1.

T027F4/PRI,   63
T027F4/ENABLE, T027F3,   00:00:50
T027F4/RES,   ANY,   -00:00:10, 00:01:00

T027F0/DELETE

T027D0/DELETE

BELLCOMM, INC.

Subject: Status Report on Experiment   From: B. H. Crane
Descriptions for the Automated
Task Scheduler (ATS) Program -
Case 610

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